MINERALOGICAL ABSTRACTS

(Vol. 8, No. 8, December, 1942.)

Notices of Books.

H (Francis), SCHAIRER (J. F.), & SPICER (H. Cecil), editors. *Handbook of physical constants.* Geol. Soc. Amer., 1942, Special Papers no. 36, ix+325 pp., 19 figs. Price $1.40.

useful collection of tables of constants important for the physics and physical istry of geological materials has been prepared under the auspices of the nal Research Council and includes data of a similar nature being compiled e U.S. Geological Survey. Each section is prefaced by an introduction by mpiler and most sections also include extensive bibliographies. The follow- e the contents:

Y (R. A.), LARSEN (E. S. *Jr.*), and LAFORGE (L.). Composition of igneous rocks, stony eteorites, and iron meteorites.
MAN (H.), DALY (R. A.), and SPICER (H. C.). Density at room temperature and one mosphere.
E (E. B. *Jr.*). Density at high temperature; thermal expansion.
CH (Francis). Density at high pressure; compressibility.
CH (Francis). Elasticity (except compressibility).
CH (Francis). Internal friction in vibrating solids.
T (L. D.) and BIRCH (Francis). Seismic velocities.
CH (Francis). Geodetic constants: Data concerning the interior of the earth.
GGS (David). Strength and plasticity.
CH (Francis) and DANE (E. B. *Jr.*). Viscosity.
ACEK (F. C.). Melting and transformation temperatures of mineral and allied substances.
CH (Francis). Effect of pressure on temperatures of melting and of solid-solid equilibrium, n systems with one component.
SON (R. E.). Effect of pressure on phase equilibria in binary condensed systems.
RANSON (Roy W.). Temperature-pressure-volume and phase relations of water.
EVIL (N. B.). Aqueous inorganic salt solutions at high temperatures.
RANSON (Roy W.). Heat capacity; heat of fusion.
LCH (Francis). Thermal conductivity and diffusivity.
ANS (R. D.), GOODMAN (Clark), and KEEVIL (N. B.). Radioactivity: The earth's heat nd geological age measurements.
DER (H. C.). Observed temperatures in the earth's crust.
CHTER (L. B.). Magnetic properties of rocks.
CHTER (L. B.) and TELKES (M.). Electrical properties of rocks and minerals.

F. A. B.

BAIRN (Harold Williams). *Structural petrology of deformed rocks.* Cambridge, Mass. (Addison-Wesley Press, Inc.), 1942, ii+143 pp., 2 pl., 178 text-figs. Price 30*s.*

1935 and 1937 Fairbairn produced successive mimeographed volumes on the ively new field of structural petrology, works which although of limited llation did much to make the fundamental but obscure German and Austrian ature on this subject more fully known to British and American petro- hers. The considerable advances in petrofabric analysis within the last five s have necessitated the present, more comprehensive, printed text-book, h in its arrangement differs materially from its mimeographed predecessors, cularly in the separation of fact from hypothesis and deduction. The work three principal parts, one dealing with observations on mineral orientation

in deformed rocks and with experimental deformation, another with the int
pretation of these observations, and a third with field and laboratory procedu
The well-illustrated text is as clearly written as the difficulties of the subj
permit, and a bibliography of 140 items is appended. The suitability of pla
loose-leaf binding for a work of this nature, of large quarto size, is, however, o
to question. C. F. D

Moore (E. S.). *American influence in Canadian mining.* With a foreword
H. A. Innis. Political economy series, no. 9. Toronto (University of Toro
Press) and London (Oxford University Press), 1941, xx+144 pp., 4 ma
Price $2.25.

This valuable study gives a sketch of the geological background and an acco
of the history, financial organization, and output of the main mining fields in
Appalachian region, the Canadian Shield, the Interior Plains, and the Cordille
region. Many of the large mining concerns are directed from the United Sta
and the development of the industry has been strongly influenced by Americ
capital, methods of mining, milling and extraction, and technical personnel a
labour. M. A. P

Temperature, its measurement and control in science and industry. Amer. In
Physics, New York (Reinhold Publ. Corp.), 1941, xii+1362 pp.

This extensive symposium, published under the auspices of the Americ
Institute of Physics and the National Bureau of Standards, consists of 126 pap
mostly relating to the measurement and regulation of temperature in natu
physical, and medical science, and in industry. Of mineralogical interest
articles by N. L. Bowen on 'Geologic temperature recorders', by E. G. Zies
'Temperatures of volcanoes, fumaroles, and hot springs', and by C. P. Saylor
'Control and measurement of temperature under the microscope'. According
Zies the temperature of erupting lava and newly erupted volcanic bombs (com
sition not stated) of the volcano Santiaguito in Guatemala is about 700° C., t
being considerably lower than the values (1015° to 1185° C.) previously recorc
for the lavas of Vesuvius, Kilauea, and the Belgian Congo volcano Nyamlagir
C. F. D

New Minerals.

Gordon (Samuel G.). *Results of the Chilean mineralogical expedition of 19*
Part VII.—The crystallography of alunogen, meta-alunogen, and pickering
Notulae Naturae, Acad. Nat. Sci. Philadelphia, 1942, no. 101, 9 pp., 6 fi
[M.A. **8**–225.]

Veins in altered andesite at Francisco de Vergara consist of colourless granu
alunogen and pink fibrous pickeringite. Measurement of the alunogen crystals
a new orientation [M.A. **3**–553] gave $a:b:c = 0{\cdot}8355:1:0{\cdot}6699$, α 89° 58′, β 97° 2
γ 91° 52′, with 56 crystal-forms 48 of which are new, and perfect (010) cleava
analysis I by W. Pitman and P. Collins gives $Al_2O_3.3SO_3.16H_2O$. Exposed
the dry desert air it becomes white and powdery (anal. II, $Al_2O_3.3SO_3.13\frac{1}{2}H_2O$
This partially dehydrated material [M.A. **3**–451] is monoclinic and is called *me*
alunogen. Pickeringite occurs in cross-fibre veins up to 10 cm. across. Sm

mm.) crystals show 121 right and left crystal-forms of which 51 are new. The ratios, $a:b:c = 0{\cdot}8655:1:0{\cdot}2551$, β 83° 26½′, of M. C. Brady [M.A. **7**–224] adopted. The crystals are now recognized as belonging to the monoclinic-noidal class C_2. They are the first mineral example [except the organic elite, Plzák and Rosický, 1908; and mesolite, Min. Mag. **23**–430] of this of symmetry, of which cane-sugar and tartaric acid are well-known mples. Anal. III of pickeringite by P. Collins.

	SO_3.	Al_2O_3.	MgO.	Na_2O.	H_2O.	Total	sp. gr.	α.	β.	γ.	2E(+).
I	37·35	16·17	nil	0·01	46·10	'99·62'	1·77	1·459	1·463	1·473	45°
II	41·04	17·33	—	—	41·44	99·81	—	1·469	1·473	1·491	large
III	36·46	12·06	4·85	—	46·26	99·63	1·83	—	—	—	—

L. J. S.

ILL (W.). *An interesting product of reaction between silica brick and a slag of high lime and iron oxide content.* Trans. British Ceramic Soc., 1942, vol. 41, pp. 46–50, 2 figs. (Reprinted from Bull. British Refractories Research Assoc., 1939, no. 49.)

ystals of an artificial mineral believed to be hitherto undescribed were ined, together with magnetite, as a reaction product in the erosion of silica k by lime-alumina-silica-iron oxide slag at 1400° C. The new mineral, for h the name *mellorite* is proposed, is probably a pyroxene. It is orthorhombic, n α 1·92, β about 1·95, γ 2·0, shows perfect (110) cleavages intersecting at ut 88°, and is intensely pleochroic from sage-green to deep reddish-brown in itudinal sections, from pale yellow-brown to deep reddish-brown in cross ions. An analysis of optically homogeneous material gives SiO_2 38·58, TiO_2 , Al_2O_3 7·84, Fe_2O_3 21·57, FeO 3·45, MnO 0·79, MgO 2·67, CaO 24·67 = 33. C. F. D.

EDOV (E. I.) Нефедов (Е. И.). *On some newly discovered minerals in the pegmatites of Adun-Cholon (Transbaikalia).* Compt. Rend. (Doklady) Acad. Sci. URSS, 1941, vol. 32, pp. 361–364.

list of 42 minerals now known to occur in the Adun-Cholon pegmatite in-les 16 new to the district: bismuth, cassiterite, zircon, rutile, brookite, verite (TiO_2 65·8, $(Ta,Nb)_2O_5$ 20·1, Fe_2O_3 8·3, SnO_2 3·5%, Y. V. Knipovich), l, opal (n 1·455), calcite, scheelite, apatite (ϵ 1·620, ω 1·625), kaolinite (α' 1·55, ·56), phlogopite (α 1·565, β 1·607), chlorite, orthite (SiO_2 30·06, TiO_2 0·95, $Yt)_2O_3$ 25·07, Al_2O_3 12·93, Fe_2O_3 4·68, FeO 11·10, MnO 0·83, CaO 8·12, MgO 7, loss on ignition 5·27%, Y. V. Knipovich), and *yttroparisite* (new mineral, agonal, a 4·008±0·030, c 4·469±0·042 Å., uniaxial, positive, ϵ 1·755, ω 1·643, usions in violet fluorite, composition near parisite but contains much yttria). M. H. H.

RASIMOVSKY (V. I.) Герасимовский (В. И.). *Nordite, a new mineral of the Lovozero tundras.* Compt. Rend. (Doklady) Acad. Sci. URSS, 1941, vol. 32, pp. 496–498, 1 fig.

Nordite, a silicate of sodium, alkaline earths, manganese, and rare-earths, occurs he valley of the Chinglusuai river, Kola peninsula, in a pegmatite containing alite, chinglusuite [M.A. **7**–222], and lomonosovite; it is orthorhombic, $a:b:c$

$=0{\cdot}730 : 1 : 0{\cdot}527$, plates on (100) bounded by (010), (110), (120), (212), and (10
with good cleavage along (100). Colour, light brown, light grey in thin section
Sp. gr. 3·430, H. 5–6, α 1·619, β 1·630–1·640, γ 1·642, 2V $31\frac{1}{2}°$, negative, α
[100], γ = [001]. Analysis by G. A. Burova gave: SiO_2 45·53, Fe_2O_3 1·84, Ce_2
8·77, lanthana earths 10·48, yttria earths 0·95, MnO 6·04, SrO 7·40, CaO 4·4
MgO 2·00, Na_2O 11·70, K_2O 0·08, Cl trace, TiO_2, $(Nb,Ta)_2O_5$, F, H_2O nil, tot
'99·27'. Another analysis for rare-earths gave: La_2O_3 8·55, Ce_2O_3 8·1, Pr_2O_3 1
Nd_2O_3 1·85%. M. H. H.

Milton (Charles). *Note on the occurrence of calcium sulphate hemihydrate (CaSO*
$\frac{1}{2}H_2O$*) in thin sections of rocks.* Amer. Min., 1942, vol. 27, pp. 517–518, 1 f

The heating in the preparation of a thin section of shale converted a veinlet
gypsum into the hemihydrate (plaster of Paris). This has α 1·55, γ 1·57, whi
distinguish it from both gypsum and anhydrite. L. J. S.

X-rays and Crystal-Structure.

Menzer (G.). *Strukturbericht:* 26, *Titelsammlung.* Zeits. Krist., 1941, vol. 10
pp. 365–390.

Continuation of previous lists [M.A. **6**–404] of titles of books and papers
X-rays and crystal-structure arranged under main-group subject-headings for t
period September 15, 1940, to January 15, 1941. L. J. S.

Harcourt (G. Alan). *Tables for the identification of ore minerals by X-ray powd*
patterns. Amer. Min., 1942, vol. 27, pp. 63–113.

X-ray powder data are listed for 162 ore-minerals in alphabetical order. T
data are also tabulated in the order of the spacing of the strongest line, to perm
ready identification. Most of the photographs have been taken with filtered C
Co, or Fe radiation and the relative intensities of the powder lines estimated
eye. The ore samples have been drilled from polished sections determined
reflected polarized light and spectrographic technique. These tables form
extension to the powder patterns of 1000 chemical substances previous
published. [M.A. **7**–227.] F. A. B.

Peacock (M. A.). *On the identification of minerals by means of x-rays.* Trans. Ro
Soc. Canada, 1941, ser. 3, vol. 35, sect. 4, pp. 105–113, 2 pls., 1 text-fig.

X-ray powder photographs are particularly useful in identifying the or
minerals. The desirable tabulated matter for one species is illustrated on löllingi
from Franklin Furnace, New Jersey [M.A. **3**–453, **5**–175], $Fe_{1+x}As_{2-x}$, spac
group $D_{2h}^{12} = Pmnn$, a 2·87, b 5·28, c 5·97 Å., Z 2, measured sp. gr. 7·43, for whi
a completely indexed and thus verified list of spacings is given with estimat
intensities. Powder photographs (Cu-$K\alpha$, 1 mm. = 1° θ), including those
tetradymite, cobaltite, gersdorffite, corynite, and ullmannite, are reproduced f
identification by direct comparison. M. A. P.

Raman (*Sir* C. V.). *Reflexion and scattering of X-rays with change of frequenc*
I. Theoretical. Proc. Roy. Soc. London, Ser. A., 1942, vol. 179, pp. 289–30
3 figs. *II. Experimental.* Ibid., pp. 302–314, 2 pls., 3 text-figs. [M.A. **8**–131

The first paper sets out in detail the nature of the interactions between t

ent X-rays and the vibrations excited in the crystal lattice. The quantum or ified scattering is due to excitation of elastic or low frequency vibrations, is portional to N, the number of lattice cells, and is distributed over a wide e of solid angles. The quantum or modified reflection is due to the excitation e infra-red or high frequency vibrations of the crystal lattice and its intensity, hat of the classical or unmodified reflections, is proportional to N^2. The law mperature dependence of intensity is quite different in the classical and tum theories. The second paper deals with experimental work on diamond. principal observations stated to be in complete agreement with the above ry are: (1) the specular character of the quantum reflection from the (111) es; (2) the geometric law of such reflection which in general falls outside the e of incidence; (3) the faint elliptic spots and elongated streamers noticed in in special cases; (4) the failure of the (110) planes to exhibit similar reflec- ; (5) the persistence of the reflections by the (111) planes with undiminished sity at liquid-air temperature and the relatively small increase of intensity gh temperatures; and (6) the appearance of a diffuse scattering having an minished intensity at low temperatures. The difference in behaviour of ond and other substances is related to differences in their infra-red spectra. . **8**–209.] F. A. B.

N (H. A.). *Diffuse scattering of X-rays by crystals. The Faxén-Waller theory and the surfaces of isodiffusion for cubic crystals.* Proc. Roy. Soc. London, Ser. A, 1942, vol. 179, pp. 320–340, 4 figs.

n elementary derivation is given of the Faxén-Waller formula for the diffuse tering of X-rays by thermally excited lattice vibrations and the shapes of the aces of isodiffusion in reciprocal space for cubic crystals investigated. The ry is illustrated for sodium. [M.A. **8**–128.] F. A. B.

STON (G. D.). *Quantum theory and diffuse X-ray reflexions.* Nature, London, 1942, vol. 149, pp. 373–374.

useful summary of the two principal theories advanced to explain the diffuse ay reflections on photographs of single crystals of a chemically pure substance, from strain. There is general agreement that the diffuse reflections are due to ement of the atoms or molecules of the crystal from their normal positions. differences of interpretation arise in assigning the cause of the movement and he mechanism of X-ray scattering. The European and American physicists rd the normal Laue and Bragg reflections as a picture of the static geometry e crystal, whilst the diffuse reflections are a picture of its dynamic vibrations. Indian physicists [M.A. **8**–130] emphasize the quantum aspect of the reactions ween X-rays and the atomic oscillators of the crystal. The possible atomic ements fall either within the elastic range of frequencies or within the infra- The interaction of X-rays with the latter modes of vibration are supposed roduce the diffuse reflections, whereas the X-ray effects due to the elastic ations are spread over a wide range of angles. The infra-red vibrations pro- from atoms vibrating within the lattice cells, whereas the elastic vibrations regarded as due to the vibration of the lattice cell as a unit. The author ws that on this view the well-marked diffuse reflections of single crystals of

aluminium, sodium, and lead should be due to interaction between X-rays a the elastic modes of vibration, which is contrary to Raman's theory. F. A. B.

Zachariasen (W. H.). *On the diffuse X-ray diffraction maxima observed by C. Raman and P. Nilakantan.* Physical Rev. (Amer. Phys. Soc.), 1941, vol. 5 pp. 207–208.

Diffuse spots on Laue photographs of rock-salt have been remeasured and t observed scattering angles found to differ considerably from those reported Raman and Nilakantan [M.A. **8**–131]. The positions of the extra spots do n contradict but support the diffuse scattering theory. F. A. B.

Laval (Jean). *Composition des rayons X diffusés par un cristal perturbé p l'agitation thermique.* Compt. Rend. Acad. Sci. Paris, 1942, vol. 214, p 274–276.

— *La diffusion cristalline des rayons X peut être envisagée comme résultant réflexions de Bragg, avec changement de fréquence, sur les plans d'ondes d'agit tion thermique.* Ibid., pp. 431–433.

Mathematical. [M.A. **8**–129.] L. J. S.

Charlesby (A.) & Wilman (H.). *Extra spots in electron diffraction patter* Nature, London, 1942, vol. 149, pp. 411–412, 2 figs.

The examination of electron diffraction patterns of anthracene and oth organic compounds shows that the parallelism between the electron and X-r diffraction phenomena also extends generally to the effects originating from t thermal vibrations in crystals. F. A. B.

Lonsdale (K.) & Smith (H.). *X-ray crystal photography at low temperatur* Journ. Sci. Instruments (Inst. Physics, London), 1941, vol. 18, pp. 133–13

Details are given of how to obtain powder photographs of organic substance liquid at room-temperatures, by freezing the liquid enclosed in a cellophane tu with a stream of liquid oxygen. The identification of a small amount of organic liquid is readily carried out by this method. F. A. B.

Lipson (H.) & Wilson (A. J. C.). *The derivation of lattice spacings from Deby Scherrer photographs.* Journ. Sci. Instruments (Inst. Physics, London), 194 vol. 18, pp. 144–148, 2 figs.

The adaptation of the Debye-Scherrer method of taking powder photograp to large diameter cameras is described. Methods which eliminate systematic erro are given for the calculation of spacings, and the cell size of aluminium, using 19 cm. diameter camera and copper $K\alpha$ radiation, is given as $4{\cdot}0699_6$ Å.

F. A. B.

Thewlis (J.). *Systematic determination of crystal orientation.* Journ. Sci. Instr ments (Inst. Physics, London), 1941, vol. 18, pp. 148–150, 2 figs.

A graphical method is described and formulae derived for obtaining t orientation of a crystal of a substance from X-ray rotation photographs.

F. A. B.

(F. W.). *Particle size measurements by the X-ray method.* Journ. Sci. nstruments (Inst. Physics, London), 1941, vol. 18, pp. 157–158.

hort review of previous work on the subject. The method is restricted to rement of particle sizes between 10 and 1000 Å. Under favourable condi- he accuracy of measurement for particle size 100 Å. is ±10%, but is much r smaller and larger particles. F. A. B.

ER (P. H.) & DuMond (J. W. M.). *Tests for the validity of the X-ray crystal method for determining* N *and* e *with aluminum, silver and quartz.* Physical Rev. (Amer. Phys. Soc.), 1940, vol. 57, pp. 198–206, 2 figs.

rystal imperfections, including mosaic structure, will not affect the lattice igs but may have appreciable effects on the density. An attempt has been to detect such an effect; working on silver, aluminium, and quartz, a mosaic rendering the density uncertain by about 0·04% was observed. This error s determinations of the Avogadro number and electronic charge by the method. M. H. H.

ES (Ernst). *Ionenradien und periodisches System.* Zeits. Physikal. Chem., 1939, Abt. B., vol. 43, pp. 213–228, 1 fig.

et of empirical equations is developed for the univalent radii of the elements. M. H. H.

DES (Ernst). *Die Ermittlung von Atomabständen aus der Lichtbrechung. I. Mitteilung. Über eine einfache Beziehung zwischen Ionenrefraktion, Ionenradius und Ordnungszahl der Elemente.* Zeits. Physikal. Chem., 1939, Abt. B, vol. 44, pp. 249–260. — *II. Mitteilung.* Ibid., pp. 327–343, 1 fig.

empirical relation between the effective radius and the refractivity of an s developed and used to calculate interatomic distances in simple structures. so serves to determine the separate contributions of the ions in a simple ture to the (known) interatomic distance and the refractivity. M. H. H.

E (M. v.). *Zur Elektrostatik der Raumgitter.* Zeits. Krist., 1940, vol. 103, pp. 54–70, 4 figs.

is shown that in general the mean electrostatic potential of a space-lattice s slowly from point to point and the special cases when it is constant are ced. The formulae cannot be applied directly to actual crystalline substances, e all electrical conductors, because of the field distortion at the crystal ndary. F. A. B.

SON (A. J. C.). *On the correction of lattice spacings for refraction.* Proc. Cambridge Phil. Soc., 1940, vol. 36, pp. 485–489, 3 figs.

xpressions are calculated for the divergence of the reflected beam of refrac- , which is small in comparison with other causes of line width. F. A. B.

AUMANIS (M.). *Die Verwendung des räumlichen reziproken Gitters zur Translations- und Raumgruppenbestimmung.* Zeits. Krist., 1942, vol. 104, pp. 18–27, 5 figs.

Die Konstruktion des räumlichen reziproken Gitters aus Debye-Scherrer-Aufnahmen. Ibid., pp. 167–177, 4 figs.

An application of the reciprocal lattice method to the interpretation of pow photographs of simple cubic substances. F. A. E

Lipson (H.) & Stokes (A. R.). *A new structure of carbon.* Nature, London, 19 vol. 149, p. 328, 1 fig.

— — *The structure of graphite.* Proc. Roy. Soc. London, Ser. A, 1942, 181, pp. 101–105, 5 figs.

Extra lines on X-ray photographs of several graphite specimens reveal presence of about 10% of a new polymorphous form of carbon mixed w ordinary graphite. The new form is closely related to graphite with rhom hedral cell dimensions a 3·635 Å., α 39·49°; space-group $R\bar{3}m$. F. A. E

Lonsdale (Kathleen). *Extra reflexions from the two types of diamond.* Proc. R Soc. London, Ser. A., 1942, vol. 179, pp. 315–320, 6 pls. [M.A. **8**–211.]

An account of X-ray photographs obtained from diamonds classified Robertson, Fox, and Martin as type I and type II which differ in their infra- spectra [M.A. **5**–209, 213; **6**–6, 494]. Two kinds of extra reflections are obser on well-exposed Laue photographs: primary diffuse reflections which are, l diffuse reflections observed with other substances, temperature-sensitive; a secondary reflections (sharp spots, streaks, and groups of spots) which are o slightly temperature-sensitive but are strongly structure-sensitive—i.e. th appear strongly for some diamonds, weakly for others, and not at all for the r type II diamonds. No explanation of the secondary reflections can account the structure-sensitiveness and the presence of (220) spots. Only type I diamo show the secondary reflections. Primary diffuse reflections which appear on diamond photographs can be accounted for by the Faxén-Waller theory. F. A. B

Bose (H.) & Ray (B. B.). *Allotropes of tellurium by X-ray diffraction meth* Indian Journ. Physics, 1941, vol. 15, pp. 233–240, 1 pl.

Precipitated tellurium is not amorphous, but rhombohedral with data agreei with those previously given for metallic tellurium [M.A. **2**–332, 515]. The X-r patterns taken at different temperatures up to the melting-point do not supp the idea that there is more than the one modification. L. J. S.

Edwards (O. S.), Lipson (H.), & Wilson (A. J. C.). *Structure of cobalt.* Natu London, 1941, vol. 148, p. 165.

Powder photographs of hexagonal cobalt show a mixture of sharp and bro lines. The variation in sharpness is not due to internal strains or small partic of unusual shapes, but to frequently occurring faults in the sequence of t hexagonal close-packing of cobalt atoms. F. A. B.

Koern (V.). *Das binäre Legierungsystem Ag–Te.* Naturwiss., 1939, vol. 2 p. 432; Acta Comm. Univ. Tartu., 1940, vol. 35, no. 4, 45 pp.

Thermal, microscopical, and X-ray examination show only two compounds the system Ag–Te, both of which exist as two modifications. The low-temperatu α-Ag_2Te is apparently orthorhombic with a 13·0, b 12·7, c 12·2 Å.; the α–β chan

s at 165°, and melting at 958°; α-$Ag_{12}Te_7$ is hexagonal with *a* 13·429, 608 Å. and space-group D^1_{6h} or D^1_6; α–β change at 408°. [Cf. hessite, M.A. ; **5**–175, 310; **6**–38.] L. J. S.

T (U.) & Halla (F.). *Röntgenographische Untersuchungen in den Systemen Mn–Bi, Co–Sb, Ni–Sb.* Zeits. Physikal. Chem., 1938, Abt. B, vol. 40, pp. 285–307, 8 figs.

Sb and NiSb have the NiAs structure, the cell-sides for the former being 56, *c* 5·183 Å.; Ni_2Sb (? Ni_5Sb_2) is tetragonal, *a* 5·78, *c* 6·00 Å.; Ni_3Sb, cubic, 6 Å., takes up Ni interstitially; $CoSb_2$ and $NiSb_2$ have the marcasite structure, *a* 3·21, *b* 5·78, *c* 6·41 Å., and *a* 3·21, *b* 5·63, *c* 6·23 Å., respectively. The Bi system shows two phases: one orthorhombic with *a* 4·31, *b* 5·24, *c* 6·31 Å., ably Mn_2Bi; the other tetragonal with *a* 5·83, *c* 5·35 Å., probably $MnBi_2$. M. H. H.

ETT (Charles S.) & Geisler (Alfred H.). *Atomic distribution in aluminum-silver alloys during aging.* Journ. Applied Physics (Amer. Inst. Physics), 940, vol. 11, pp. 733–739, 12 figs.

uminium-rich Al–Ag alloys, initially homogeneous, segregate on ageing at -temperature or annealing. In the early stages of segregation Laue photo-ns show streaks along certain zone-traces, which can be accounted for if the phase consists of very thin plates, from one to five unit cells thick, parallel e (111) planes of the main crystal. The nature of the new phase in these stages is discussed. M. H. H.

N (E. A.) & Sully (A. H.). *On the migration of atoms in iron-nickel alloys.* Phil. Mag., 1941, ser. 7, vol. 31, pp. 314–338, 5 figs.

ckel-iron alloys of various compositions were submitted to a variety of heat-ments, and the cell-dimensions of the α and γ phases determined; the viour is very complex, but there is clear evidence that migration of nickel s from the α to the γ lattice or the reverse can be induced by suitable heat-ment. The α phase is much more easily brought to equilibrium than the ase. M. H. H.

ANSKY (Y.)] Уманский (Я.). Рентгенографическое исследование некоторых соединений ниобия. [*Röntgenographic investigation of some niobium compounds.*] Журнал Физической Химии, Акад. Наук СССР [Journ. Physical Chem., Acad. Sci. USSR], 1940, vol. 14, pp. 332–339, 1 pl., 2 text-figs.

obium containing H 0·42% gave two body-centred cubic patterns, one with 00–3·306 Å. for niobium, and the other with *a* 3·416–3·420 Å. perhaps for I. Niobium nitride NbN (N 8·8%) is hexagonal with *a* 3·017, *c* 5·580 Å. ides are face-centred cubic, *a* 4·395 Å. with C 3·5% increasing irregularly to 462 Å. with C 10·9%, suggesting two carbides Nb_4C or Nb_3C and NbC or C_3. L. J. S.

COCK (M. A.) & Smith (F. G.). *Precise measurements of the cube-edge of common pyrite and nickeliferous pyrite.* Univ. Toronto Studies, Geol. Ser., 1941, no. 46, pp. 107–117, 4 figs.

rite from Leadville, Colorado, with composition $FeS_{2\cdot00\pm0\cdot01}$ and free from

Ni and As, specific resistance at 20° C. 32·6 ohms/cm. cube, temperature c efficient of resistance, 20–200° C., negative, gave a 5·4079±0·0005 Å., sp. 5·005±0·005, calculated 5·003. Pyrite from Rio Marina, Elba, compositi $FeS_{1·98±0·01}$, SiO_2 trace, As none, Au none, Mn < 0·0001%, specific resistance 20° C., 0·014 ohms/cm. cube, temperature coefficient of resistance, 20–200° positive, gave a 5·4063±0·0005 Å., sp. gr. 5·020±0·005, calculated for excess in S-positions 5·014, calculated for vacant S-positions 4·981. Pyrite with Ni 6½ gives a 5·419±0·002 Å., as predicted by Bannister. [Min. Mag. **25**–612; M. **7**–510, **8**–70.] M. A. P.

Peacock (M. A.), with a chemical analysis by Meen (V. B.). *On joseite, grü lingite, oruetite.* Univ. Toronto Studies, Geol. Ser., 1941, no. 46, pp. 83–1(14 figs.

Platy joseite from Glacier Gulch, near Smithers, British Columbia, is rhoml hedral with space-group $D^5_{3d} = R\bar{3}m$; a 13·45 Å., α 18° 8′; forms (111) (emine cleavage), uncertain (100), (432). Homogeneous in polished section; hardness (Talmage) on the base, A across the folia; sp. gr. 8·10. Analysis, Bi 82·7, 12·0, S 6·0 = 100·7, giving the composition and cell content Bi_4TeS_2. The X-r powder pattern (indexed and reproduced) is identical with the patterns grünlingite (sp. gr. 8·15) from Cumberland, and oruetite (sp. gr. 8·11) from Spa Joseite from San José, Minas Geraes, Brazil ('type of A. Damour') has sp. 8·03 and a slightly smaller cell; another specimen from Minas Geraes ('analys by Genth, 1885') has sp. gr. 8·3, a 13·81 Å., α 18° 2′. Joseite from Precambri mine, Vernon, British Columbia, gives sp. gr. 8·2, a 14·26 Å., α 17° 47½′. T materials with the larger cells also show additional phases in X-ray photograp The available analyses, excluding those of grünlingite, give the general compo tion and cell content of joseite, $Bi_{4+x}(Te,Se,S)_{3-x}$, with x 0–0·3, and suggest t chemical types, $Bi_{4+x}Te_{1-x}S_2$ and $Bi_{4+x}Te_{2-x}S$. [M.A. **8**–108, 183.] M. A. P.

Berry (L. G.) & Moddle (D. A.). *Studies of mineral sulpho-salts: V—meneghin from Ontario and Tuscany.* Univ. Toronto Studies, Geol. Ser., 1941, no. 4 pp. 5–17, 9 figs.

Meneghinite recently identified from Anglesea, Ontario [M.A. **8**–7] occurs columnar masses up to 5 × 10 mm. in vein quartz and shows Cu by microchemi test. A needle of meneghinite from Bottino mine, Tuscany, with sp. gr. 6·4 6·40, and microchemical Cu, gives the unit cell with a 11·36, b 24·04, c 8·26 containing $Cu_2Pb_{26}Sb_{14}S_{48} = Cu_2S.26PbS.7Sb_2S_3$ (8 analyses) [M.A. **7**–231, 38 A pseudo-cell with a, b, $c/2$, has the space-group $D^{16}_{2h} = Pbnm$. The compl crystal forms suggest two super-lattices. The X-ray powder pattern is index and reproduced with the patterns of jamesonite, boulangerite, and zinckeni which are all much alike in polished sections. M. A. P.

Fisher (D. Jerome). *Discussion of "the formula of jordanite".* Amer. Min., 19 vol. 25, pp. 297–298.

A new determination of the specific gravity of a measured crystal of jordan [M.A. **7**–387] gave 6·38; and the formula $Pb_{14}As_7S_{23}$ [$= 3\frac{1}{2}(4PbS.As_2S_3) - 1\frac{1}{2}$ is considered to be more probable than $Pb_{14}As_7S_{24}$. L. J. S.

(E.) & Croatto (U.). *Fluoritgitter mit leeren Anionenplätzen.* Zeits. Anorg. hem., 1939, vol. 242, pp. 79–86, 3 figs.

d crystals of CeO_2 and La_2O_3 exist, containing up to 45 mol. % La_2O_3, he structure of CeO_2 and a proportion of vacant oxygen positions.

M. H. H.

iel (H.) & Tscheischwili (L.). *Zur Struktur von Na_2BeF_4.* Zeits. Krist., 941, vol. 103, pp. 178–185, 3 figs.

stals of Na_2BeF_4, sp. gr. 2·471, have unit-cell dimensions a 4·89$_2$, b 10·90$_0$, A. with four molecules in the unit cell; space-group $D_{2h}^{16} = Pbnm$. A rity is found between the powder patterns of this compound and those of ite and monticellite, and it is stated to have the same type of crystal-ure as olivine. [M.A. **8**–290.]

F. A. B.

(Lars Gunnar) & Edstrand (Maja). *On the crystal structure of Arppe's ismuth oxychloride $Bi_{24}O_{31}Cl_{10}$, and the isomorphous oxybromide ("step-itice oxyhalides").* Zeits. Krist., 1942, vol. 104, pp. 178–196, 6 figs.

en BiOCl and BiOBr are heated to above 600° C. they form flat cruci-winned needles which are paler yellow at room-temperatures and have the mensions a 9·99$_5$, 10·13; b 3·969, 4·008; c 29·44, 29·97 Å., β 88·77°, 90·15°, tively. The space-group is C_{2h}^3, C_2^3, or C_s^3 and the cell contents are $Bi_{24}O_{31}$ similarly for the bromide. An idealized structure is calculated from the ities of the X-ray diffractions consisting of metal-oxygen sheets like those other oxyhalides. These sheets are cut off like boards, infinite in one ion only [010]. The boards are connected to form infinite flights of stairs gh the lattice and the stairs are separated by single boards of halogen s. [Compare American work on layer-lattice minerals, e.g. B. E. Warren **8**–136.]

F. A. B.

ka (H.). *Crystal structure of silicon monoxide.* [Mazda Kenkyu Jiho, 940, vol. 15, pp. 305–309], Abstract in Rev. Physical Chem. Japan, 1941, ol. 15, p. 56.

O has a cubic unit cell, a 6·4 Å., containing 8 molecules; space-group T_h^6. A n atom is at the centre of a sheared tetrahedron of four oxygen atoms.

L. J. S.

sh (Joseph) & Buerger (M. J.). *The tridymite problem.* Science, New York, 1942, vol. 95, p. 21; Amer. Min., 1942, vol. 27, pp. 143–144. (Abstract of paper read before the Crystallographic Society, November 17, 1941.)

idymite from Plumas Co., California has a face-centred orthorhombic lattice a 9·91, b 17·18, c 81·57 Å.; from San Cristobal, Mexico, the same a and b es, but the c-axis half as long. The former shows an inversion at 127° C., and atter two inversions at 121° and 135° C. Weissenberg patterns taken just e the inversion show the hexagonal silica framework with a superimposed orhombic pattern. These inversions are not reversible. The Plumas Co. erial contains impurities, the composition approximating to $NaCaAl_3Si_{15}O_{36}$, this no doubt accounts for the different behaviour.

L. J. S.

Shishakov (N. A.). *On the crystals of quartz glass.* Compt. Rend. (Dokla Acad. Sci. URSS, 1939, vol. 23, pp. 788–791.

Glasses are not amorphous. Electron diffraction and X-ray diffraction d for quartz glass are consistent with the presence of platy crystals structur similar to the Si_2O_5-sheet structures of mica, clay, &c. M. H. H

Rooksby (H. P.) & Thomas (L. A.). *The structure of vitreous silica.* Nat London, 1942, vol. 149, pp. 273–274, 1 fig.

Variations in the structure of vitreous silica recently reported by Lu Chang [M.A. **8**–139] using pin-hole transmissions and powder photographs not substantiated. A detailed criticism of the interpretations of their X- photographs is given. F. A. B

Akiyama (K.). *Analysis of calcined lime by X-rays.* [Waseda Appl. Chem. S Bull., 1940, vol. 17, pp. 26–27], abstract in Rev. Physical Chem. Jap 1941, vol. 15, p. 56.

The X-ray pattern of $CaCO_3$ calcined at 900° C. shows that crystallization CaO has partly occurred and is the same as that of material calcined at 1500° The differences in reactivity of light and hard calcined lime are due to coarsen of the state of aggregation. L. J. S

Hoppe (W.). *Über die Kristallstruktur von α-AlOOH (Diaspor) und α-FeO (Nadeleisenerz).* Zeits. Krist., 1940, vol. 103, pp. 73–89, 9 figs.
— *Über die Kristallstruktur von α-AlOOH (Diaspor) II. Fourieranalyse.* Ibi 1942, vol. 104, pp. 11–17, 1 fig.

Ewing's results [M.A. **6**–175] are confirmed, and more exact parameters duced for the crystal-structures of diaspore and goethite. F. A. B

Weiser (Harry B.) & Milligan (W. O.). *An electron diffraction study of hydr oxides amorphous to X-rays.* Journ. Physical Chem., 1940, vol. 44, 1081–1094, 13 figs.

Electron diffraction studies have shown that a number of gelatinous hydrox precipitates which appear amorphous to X-rays are really minutely crystalli Precipitated ferric oxide consists of haematite except when it is precipitated fr an old or basic solution of ferric chloride, when it includes some β-FeO.O precipitated alumina consists of γ-AlO.OH, and ages under water to α-Al(OH precipitated gallia consists of α-Ga_2O_3; precipitated titania is crystalline, but neither rutile nor anatase; but gels of chromic oxide, silica, and tantalum a columbium [niobium] pentoxides are amorphous. M. H. H.

Billiet (V.) & Vandendriessche (A.). *De deshydratatie der natuurlijke wat houdende koper- en kobaltoxyden (Röntgenonderzoek).* [Dehydration of natu hydrous copper and cobalt oxides.] Natuurwet. Tijds. Gent, 1940, vol. (for 1939), pp. 311–322. (Flemish with French summary.)

The minerals heterogenite, stainierite, mindigite, and trieuite, which all gi the same X-ray pattern and have the composition $(CuO,Co_2O_3).H_2O$ with differe Cu : Co ratios, lose water and oxygen when heated to give the spinel $(Cu,Co)Co_2$ Anhydrous Co_2O_3 could not be obtained. [M.A. **8**–86.] M. H. H.

r (Lynn J.) & Davey (Wheeler P.). *The X-ray diffraction pattern of tri-lcium aluminate.* Journ. Chem. Physics (Amer. Inst. Phys.), 1941, vol. 9, p. 663–666, 6 figs.

y pure $3CaO.Al_2O_3$ has a cube edge of 15·235 Å. with 24 molecules in the ell. The measurements were made with a new form of apparatus with an atic recorder. L. J. S.

oel (Clifford) & Heinrich (E. Wm.). *New data on hetaerolite, hydrohetaero-te, coronadite, and hollandite.* Amer. Min., 1942, vol. 27, pp. 48–56.

aerolite, sp. gr. 5·18, from Sterling Hill and Franklin Furnace, New Jersey, nit-cell dimensions a 5·74, c 9·15 Å., space-group $D_{4h}^{19} = I4/amd$, with cell nts $4ZnMn_2O_4$. The mineral is isostructural with hausmannite. Botryoidal hetaerolite from Sterling Hill is identical with fibrous specimens of the l from Leadville, Colorado (previously named hetaerolite by Ford and y, 1913). Cell dimensions are a 5·71, c 9·04 Å., and the mineral is probably entred tetragonal, but its status is uncertain and its formula $ZnMn_2O_4.H_2O$ probable. Powder data are given for hetaerolite, hydrohetaerolite, and r coronadite and hollandite. The last two are considered isostructural with y-centred pseudo-tetragonal unit cell a 6·95, c 5·72 Å. for coronadite and c 5·71 Å. for hollandite. Not all the powder lines can be indexed on these sions, however. Hollandite and psilomelane (= romanechite) yield entirely nt powder patterns. F. A. B.

guti (Tasaburô). *Diffraction of cathode rays by vivianite.* Proc. Physico-Math. Soc. Japan, 1936, ser. 3, vol. 18, pp. 372–379, 5 figs.

ianite gives a monoclinic base-centred cell of dimensions a 9·997, b 13·37, 6 Å. ($a : b : c = 0·749 : 1 : 0·354$), β 75° 44′. Electron reflections from the cleavage give a mean internal potential of 10 volts, and the apparent tive index decreases in the lower orders. [M.A. **7**–90, 259.] L. J. S.

n (S. M.), Klimov (A. I.), & Umansky (M. M.).] Бунин (С. М.), Климов (А. И.), Уманский (М. М.). Рентгеноанализ кристалла вольфрамита. *Röntgen analysis of a crystal of wolframite.*] Журнал Физической Химии, Акад. Наук СССР (Journ. Physical Chem., Acad. Sci. USSR), 1940, vol. 14, pp. 844–845.

rystal of wolframite of orthorhombic aspect gave $a : b : c = 0·835 : 1 : 0·870$ pacings a 4·78, b 5·73, c 4·98 Å.; space-group C_{2h}^4. L. J. S.

(Zoltán). *Beiträge zur Kenntnis des Kristallgitters von Colemanit* ($Ca_2B_6O_{11}.5H_2O$). Zeits. Krist., 1941, vol. 103, pp. 431–433.

tation and powder photographs of colemanite gave a unit cell of dimensions 1, b 11·12, c 6·10 Å. containing two molecules $Ca_2B_6O_{11}.5H_2O$ (taking 51′, sp. gr. 2·42). L. J. S.

y-Szabó (St. v.) & Pócza (J.). *Die Struktur des Silberchlorats* $AgClO_3$. Zeits. Krist., 1942, vol. 104, pp. 28–38, 6 figs.

rstals of silver chlorate with sp. gr. 4·37 have unit-cell dimensions a 8·486, 94 Å., with contents $8AgClO_3$ and space-group $C_{4h}^5 = I4/m$. Atomic co-ates of the crystal-structure are given. F. A. B.

Strunz (H.). *Salesit $CuJO_3OH$ und Olivin Mg_2SiO_4.* Zeits. Krist., 1941, vol. 1
pp. 359–360.

Interchanging the axes, the cell dimensions of salesite [M.A. **7**–369] bec
a 6·70, *b* 4·78, *c* 10·77 Å., and then show a similarity to those of olivine (*a* 6
b 4·77, *c* 10·28 Å.). The space-group D_{2h}^{16} is the same for both, and they
regarded as isotypes, with a deformed tetrahedron IO_3OH or HIO_4 equival
to SiO_4. L. J. S

O'Daniel (H.) & Tscheischwili (L.). *Zur Struktur von γ-Ca_2SiO_4 und Na_2Be*
Zeits. Krist., 1942, vol. 104, pp. 124–141, 2 figs.

Single crystals of γ-Ca_2SiO_4 sufficiently large for unit-cell measurements h
not yet been prepared. However, a powder photograph is sufficiently close
that of Na_2BeF_4 to render indexing possible. The unit-cell dimensions t
deduced are *a* 5·06, *b* 11·28, *c* 6·78 Å., containing $4Ca_2SiO_4$. The space-grou
$D_{2h}^{16} - Pbnm$, and like Na_2BeF_4 it has the same type of crystal-structure
olivine. Tephroite with *a* 4·8, *b* 10·6, *c* 6·3 Å. is also stated to possess the sa
crystal structure. The powder photograph of a modification obtained by heat
Na_2BeF_4 to 300° C. is not similar to that of α-Ca_2SiO_4, but has a hexagonal u
cell containing $2Na_2BeF_4$ and measures *a* 5·31, *c* 7·08 Å. A detailed discussio
given of the tolerance of a structural type based upon a close-packed oxy
lattice. [M.A. **8**–287.] F. A. B

Nowacki (W.). *Beziehung zwischen $K[AlSiO_4]$ (Tief-Kaliophilit), $Ba[Al_2$
$K[LiSO_4]$, $Na[AlSiO_4]$ (Nephelin) und $[Si_2O_4]$ (β-Tridymit).* Naturwi
1942, vol. 30, pp. 471–472, 2 figs.

Assuming pseudo-cells a relationship is traced between the dimensions of th
compounds. L. J. S

Wyart (Jean). *Structure atomique de la leucite.* Compt. Rend. Acad. Sci. Pa
1941, vol. 212, pp. 356–358.

Artificially prepared crystals of leucite, *a* 12·95 *c* 13·65 Å. with space-gr
$C_{4h}^6 = I4_1/a$ and $16KAlSi_2O_6$ in the unit cell, become cubic on heating to 625°
with *a* 13·40 A. and space-group $O_h^{10} = Ia3d$. Its silicon-aluminium-oxy
framework then becomes identical with those of analcime and pollucite. [M
7–278, 398.] F. A. B

Náray-Szabó (St. v.). *Die Struktur des Leucits $KAlSi_2O_6$.* Zeits. Krist., 19
vol. 104, pp. 39–44.

Small crystals of leucite from Monti Albani, Roma, from oscillation (on
artificially ground face (100)) and powder photographs, gave *a* 13·01, *c* 13·82
with $16KAlSi_2O_6$ in the unit cell; space-group $C_{4h}^6 = I4_1/a$. The structure
similar to that of analcime and pollucite [M.A. **7**–238]. L. J. S

Mende (Ilse). *Die Gitterkonstante von MgAl-Granat.* Zentralblatt Min., Abt.
1941, pp. 137–139, 1 fig.

The garnets as rock-forming minerals can be determined by their X-r
constants. The value for pyrope as given by G. Menzer [M.A. **3**–251. **4**–111

r than that for almandine, although the atomic radius of Mg is less than of Fe, and MgO has a 4·20 A. while FeO has a 4·28 A. A new determination for yrope from Meronitz, Bohemia, gave a $11{\cdot}51_5$. This garnet contains 16% $(Fe,Mn)_3Al_2(SiO_4)_3$ with a 11·50 A. and 11% of $Ca_3Al_2(SiO_4)_3$ with a 11·84 A. xtrapolation on a graph plotting the cell sides of garnets against the R″ s the value for pure $Mg_3Al_2(SiO_4)_3$ is a 11·455 A. L. J. S.

TS (O.) & MUSSGNUG (F.). *Die Gitterkonstanten von Långbanit.* Zentralblatt Min., Abt. A, 1942, pp. 12–13.

hexagonal crystal of långbanite from Långban, Sweden, gave a 11·54, c A. ($a:c$ = 1 : 0·961); space-group D^1_{6h} – $C6/mmm$. From the unsatisfactory ned analyses the following formula is suggested for the contents of the ell: $(Mn''_{42}Ca_3)^{[8]}(Sb^V_6Fe'''Mg_3Mn'''_4)^{[6]}(Si_{16}Mn^{VII}_{11})^{[4]}O_{159}(OH)_3$. L. J. S.

ATSCHKI (F.) & MUSSGNUG (F.). *Über die Kristallstruktur des Chloritoids.* Naturwiss., 1942, vol. 30, p. 106.

oritoid (including sismondine and masonite) is a Fe-brittle-mica as distinct the Ca-brittle-micas (margarite, brandisite, &c.) and the formula has been as $H_2FeAl_2SiO_7$. A formula based on a mica type of structure is criticized. itoid has a 5·4, b 9·4, c 17·85 A.: a and b are near those of brucite and te, while c differs from that of biotite (20·12 A.) and brandisite (19·24 A.). following formula is based on a talc-like structure with FeOH layers between te layers: $^2_X Fe^{++}(OH)_2\{(OH)_2(Fe,Al,Mg)_3[(Si,Al)_4O_{10}]\}$. L. J. S.

ELHARDT (Wolf v.). *Die Strukturen von Thuringit, Bavalit und Chamosit und ihre Stellung in der Chloritgruppe.* Zeits. Krist., 1942, vol. 104, pp. 142–159, 3 figs.

dexed powder data are given for thuringite, bavalite, and chamosite from d localities. Unit-cell dimensions are thence deduced: for thuringite a 5·376, b 9·297, 9·312, c 14·10, 14·06 A., β 82° 40′; bavalite a 5·397, b 9·348, 10 Å., β 82° 35′; chamosite a 5·393, b 9·341, c 14·00 A. Unit-cell contents are ulated using chemical analyses in the literature, and a crystal-structure for mosite is suggested similar to that of Pauling's for chlorite with $\beta = 90°$ A. **4**–465]. F. A. B.

E (E. M.) & HUSE (G.). *Examination of 'Egyptian blue' by X-ray powder photography.* Nature, London, 1940, vol. 146, p. 26.

-ray diffraction photographs have been used to identify 'Egyptian blue' O.CaO.4SiO_2) and $CuAl_2O_4$ in ancient Egyptian ornaments. M. H. H.

Instruments and Apparatus.

GG (W. L.). *The X-ray microscope.* Nature, London, 1942, vol. 149, pp. 470–471, 5 figs.

mprovements to apparatus previously described [M.A. **7** 399], particularly replacement of the brass plate drilled with holes by a photographic reproduc-

tion of a diagram representing the cross-grating spectra. The method promi to be useful for the rapid summation of Patterson-Fourier series. F. A. B

Orowan (E.). *A new method in X-ray crystallography.* Nature, London, 19 vol. 149, pp. 355–356, 3 figs.

A grid of copper wires (0·19 mm. thick, 23 wires per cm.) stuck to a stro cellophane sheet by 'durofix' is placed in front of an X-ray plate used in a ba reflection camera. The grid is rotated in its own plane during exposure at t same speed as the crystal which rotates about a vertical axis. The shadows several wires appear as fine lines upon every diffraction spot; their inclinati to a reference-line can be measured and the position of the grid wires and the fore the crystal itself determined at the moment of reflection. The meth determines crystal orientations directly and could also be used to investig mosaic imperfections of crystals. The shadow lines are often found to be prolong beyond the Bragg reflection spots into the background, possibly due to the diffu reflection of X-rays caused by thermal vibrations of the atoms. F. A. B.

Bezzi (Silvio). *Fotometro integratore per röntgenfotogrammi.* Gazz. Chim. It 1940, vol. 70, pp. 160–166, 2 figs.

A photoelectric cell is used with a microscope to integrate the intensity of sp on a Weissenberg photograph illuminated with a lamp and condenser. F. A.

Robertson (J. Monteath) & Dawton (R. H. V. M.). *Photometry of X-r crystal diffraction diagrams.* Journ. Sci. Instruments (Inst. Physics, Londo 1941, vol. 18, pp. 126–128, 1 fig.

The integrated intensity of an X-ray diffraction from a crystal plane may measured most accurately by the ionization spectrometer method which, howev cannot be used for very small crystals. For these a new method is described which the X-ray film is scanned by a small spot of light which is passed into photoelectric cell followed by a single stage of valve amplification. The circuit so designed that the output read by a milliammeter is directly proportional to t X-ray energy which fell upon the film. The relative accuracy for strong and we spots of the new and previous methods is estimated. F. A. B.

Jay (A. H.). *A simple photometer for the examination of X-ray films.* Journ. S Instruments (Inst. Physics, London), 1941, vol. 18, pp. 128–130, 6 figs.

Light from a small filament lamp is focused upon a powder photograph and t transmitted energy received by a photoelectric cell connected to a galvanomet The apparatus produces relative intensity records of powder photographs mixtures of two or more substances and can also be used for intensity measu ments. The atomic scattering value of aluminium has been calculated fro measurements on a powder photograph. F. A. B.

Jong (W. F. de) & Bouman (J.). *Over het reciproke tralie van kristallen.* [On t reciprocal lattice of crystals.] Natuurwet. Tijds. Gent, 1940, vol. 21 (f 1939), pp. 291–303, 8 figs.

An X-ray camera in which a flat film perpendicular to the crystal-axis of rot

lso rotates about that axis is described. The diffractions are indexed by ocal lattice methods. F. A. B.

TRA (P.). *Houten bollen voor struktuur-modellen.* [Wooden balls for structure models.] Natuurwet. Tijds. Gent, 1940, vol. 21 (for 1939), pp. 284–290, 9 figs.

apparatus is figured and described for drilling holes at the correct angles in f plastic wood for the building of crystal-structure models. F. A. B.

KÝ (Vojtěch). *Die Projektionskugel, ein Hilfsmittel bei der Kristalluntersuchung.* Zeits. Krist., 1941, vol. 103, pp. 353–354, 1 fig.

is-shapen crystal or fragment of obscure orientation is measured in any convt position on the two-circle goniometer, and the results plotted on a sphere m. radius marked with meridian and latitude circles each 2°. The sphere es about a vertical axis, and is surrounded by a graduated circle revolving a horizontal axis. From this other angles can be more easily read off than distorted stereographic or gnomonic projection. L. J. S.

KA (Hideo). *A device for measuring the extinction angle.* Amer. Min., 1940, ol. 25, pp. 735–737, 3 figs.

eyepiece of a polarizing microscope is replaced by a photometer consisting hotoelectric cell, amplifier, and galvanometer. Providing a crystal section ge enough to fill the field of the microscope the extinction-angle can be ured correct to 30 minutes. F. A. B.

SSON (V. A.). *Equipment for the double variation method of refractive index determination. I. An improved stage cell. II. Variable temperature control apparatus.* Amer. Min., 1940, vol. 25, pp. 763–766, 3 figs.

elliptical stage cell has been designed which eliminates air bubbles and es the turbulence of the flowing water. A simple hot water supply system is lescribed in detail. F. A. B.

(S. M.). *A simple method for refractive index determinations.* Journ. Sci. Instruments (Inst. Physics, London), 1941, vol. 18, pp. 20–21, 1 fig.

simple form of refractometer is described, using a cylindrical specimen and ble of about $\frac{1}{2}\%$ accuracy. It is especially applicable to glass rod. M. H. H.

DEFROY (C.). *Description d'un compensateur bilame tournant.* Bull. Soc. Franç. Min., 1936, vol. 59, pp. 387–391, 4 figs.

o 5 mm. squares of quartz about $\frac{3}{4}$ mm. thick are crossed to compensate retardations and mounted on the end of a glass slide. By tilting this plate e the objective of a Nachet microscope any retardation normally given by a tz wedge can be obtained. It is more robust than a quartz wedge and can be used in place of a $\frac{1}{4}$ wave-plate of mica and a sensitive tint plate. F. A. B.

Klein (S.). *Reise- und Laboratoriums-Gerät zur raschen quantitativen Schu mineralabscheidung.* Zentralblatt Min., Abt. A, 1942, pp. 110–112, 1 fig.

The lower portion of the separating apparatus below the cock-stop is a separ closed tube with rubber connexion. L. J. S

Smallman (Beverley N.). *A simple apparatus for the direct determination of volume of small irregular objects.* Proc. Roy. Soc. Edinburgh, Sect. B, 19 vol. 61, pp. 186–187, 1 fig.

A description of a simple displacement apparatus giving consistent results w objects as small as 0·007 millilitre. C. F. D

Fuller (J. Osborn). *Mechanical polishing with a film of abrasive.* Econ. Ge 1941, vol. 36, pp. 199–211, 7 figs.

Good surfaces are rapidly obtained on ore specimens mounted in bakelite a ground and polished on metal laps using graded abrasives mixed with mine oil or 'nujol' and kerosene in equal proportions. The abrasive film is better th free rolling or fixed abrasive. At Columbia University, New York, the followi are used: rolling 100 carborundum (0·18 mm.) on cast iron; rolling FFF carbor dum (0·018 mm.) on steel; rolling 303½ optical emery (0·01 mm.) on copp abrasive film 305 optical emery (0·004 mm.) on lead; abrasive film MgO (Mer 0·002 mm.) on lead. [M.A. **8**–185.] M. A. P.

Roedder (Edwin). *Notes on final grinding of petrographic thin sections.* Am Min., 1941, vol. 26, pp. 568–570.

Greater efficiency is obtained in the final process of grinding by illuminati from below of the glass grinding plate upon which the section is rubbed dow A truly plane grinding surface must be maintained on the glass plate.

F. A. B.

Clays.

Grim (Ralph E.). *Modern concepts of clay minerals.* Journ. Geol. Chicago, 194 vol. 50, pp. 225–275, 12 figs.

Hendricks (Sterling B.). *Lattice structure of clay minerals and some properties clays.* ibid., pp. 276–290, 2 figs.

Winterkorn (Hans F.). *Applications of modern clay researches in constructi engineering.* ibid., pp. 291–306.

Kelley (W. P.). *Modern clay researches in relation to agriculture.* ibid., pp. 30 319.

Norton (F. H.). *Applications of modern clay research in ceramics.* ibid., pp. 32 350, 5 figs.

The first two papers give useful résumés of the crystal chemistry of clay minera and the manner in which the silicate layers of clay minerals are superimpose The analyses of the montmorillonite type reveal the nature of the isomorpho replacements which determine base-exchange capacity. The last three pape show how the increased knowledge of clay minerals has been applied to practic problems; e.g. whereas the engineer favours the sodium clays which are lea permeable to water, the agriculturist needs calcium clays. There still remain

ver, a mass of empirical knowledge in industry which is not co-ordinated with hysical chemistry of clay minerals. F. A. B.

(R. E.) & Bradley (W. F.). *Investigation of the effect of heat on the clay minerals illite and montmorillonite.* Journ. Amer. Ceramic Soc., 1940, vol. 23, pp. 242–248, 5 figs.

ray and optical data are given for prepared samples of illite and montmorillo- heated at various temperatures up to 1400° C. Illite loses hydroxyl water from 500° changing to an anhydrous modification with slightly higher values of the ing and lower refractive indices. This phase persists up to 700° and the final uction of the illite lattice is complete at 850°. At this temperature spinel llizes and increases in amount and particle-size to 1100 or 1200°. Alkali accompanies and finally dissolves the spinel at 1300°. Mullite is also formed 00° and persists to 1400°. Quartz originally present in the illite samples not invert to cristobalite, but dissolves in the glass at about 1050°. The nce of changes in montmorillonite is similar. The anhydrous modification, ver, begins to form at 500° and persists over a shorter temperature interval °. The formation of spinel and mullite is almost exactly parallel, but quartz llizes from a quartz-free sample of montmorillonite at 950°, inverts to balite, and dissolves in the glass at 1300°. F. A. B.

bricks (S. B.), Nelson (R. A.), & Alexander (L. T.). *Hydration mechanism of the clay mineral montmorillonite saturated with various cations.* Journ. Amer. Chem. Soc., 1940, vol. 62, pp. 1457–1464, 6 figs.

study of the water-vapour pressure of Li, Na, K, Cs, Mg, Ca, Sr, Ba, and H of three montmorillonite clays, and of their variations in (001) spacing at ent degrees of hydration. The authors conclude that the exchangeable ns are located between the silicate layers; the first water taken up goes to te the cations, except in the H, Na, K, and Cs salts where the cations are ydrated; further water is taken up in layers, with a hexagonal structure and ted between the silicate layers. M. H. H.

bricks (Sterling B.). *Base exchange of the clay mineral montmorillonite for organic cations and its dependence upon adsorption due to van der Waals forces.* Journ. Physical Chem., 1941, vol. 45, pp. 65–81, 12 figs.

variety of salts of organic amino-compounds with hydrogen-montmorillonite been prepared and their (001) spacing measured; the detailed structure of salts is considered, and it is shown that the observations can be fully ex- ed if the organic molecules are intercalated regularly between the silicate s. M. H. H.

shall (C. E.) & Bergman (W. E.). *The electrochemical properties of mineral membranes. I. The estimation of potassium ion activities.* Journ. Amer. Chem. Soc., 1941, vol. 63, pp. 1911–1916, 5 figs.

e preparation of thin, coherent films of potassium-, sodium-, calcium-, and ogen-bentonites is described; they act as semipermeable membranes and be used for the potentiometric determination of potassium. Apophyllite s gave less satisfactory results. M. H. H.

Marshall (C. E.). *Studies in the degree of dispersion of the clays. IV. The shap of clay particles.* Journ. Physical Chem., 1941, vol. 45, pp. 81–93, 2 figs.

When rod- or plate-shaped particles in a colloidal sol are oriented parallel t one another, the intensity of the light they scatter varies with direction (dity dallism); from observations of this phenonemon together with the birefringen of flow, the general shape of the particles may be deduced. Colloidal clay partic are platy with only slight elongation. M. H. H.

Ells (V. R.) & Marshall (C. E.). *The determination of exchangeable bases by t Lundegårdh spectrographic method.* Proc. Soil Sci. Soc. America, 1939, vol. pp. 131–135, 3 figs.

The Lundegårdh method has been adapted to the determination of the e changeable bases of soils and clay minerals. M. H. H.

Bosazza (V. L.). *Adsorption of malachite green by clays and allied mineral* Nature, London, 1940, vol. 146, p. 334.

Differences in the colour, pleochroism, and fastness to washing of dyed cla serve to distinguish certain members of the clay and talc groups. M. H. H.

Inuzuka (Hideo). *Observation of clay minerals using the electron microscope.* Ame Min., 1941, vol. 26, pp. 448–449, 2 figs.

A ceramic clay from Kibushi, Japan, does not reveal definite forms when e amined by the electron microscope, as does kaolinite. F. A. B.

Lapparent (Jacques de). *Sur le groupe des argiles attapulgitiques.* Compt. Ren Acad. Sci. Paris, 1941, vol. 212, pp. 971–974.

The powder photograph of attapulgite [M.A. **6**–150, **7**–425] resembles closel those of talc and pyrophyllite. The chemical formulae and crystal-structures layer-structure minerals are discussed. F. A. B.

Caillère (*Mlle* Simonne). *Sur une argile adsorbante recueillie dans les cinérit rhyolitiques de la Bourboule* (*Puy-de-Dôme*). Compt. Rend. Acad. Sci. Pari 1941, vol. 213, pp. 489–491.

A sirupy clay found in crevices in granite in contact with rhyolite tuff contai 90·85 % water. Analysis of air-dried material gave SiO_2 14·72, Al_2O_3 4·2 Fe_2O_3 6·19, MgO 0·32, H_2O+ 2·55, H_2O- 72·02 = 100·00. The heating cur shows endothermal breaks at 120°, 525°, and 700° and an exothermal break 910°, those at 525° and 910° being due to kaolinite and that at 700° to montmo illonite. Microscopical examination shows two minerals differing slightly in (about 1·558) and birefringence. The analysis is interpreted as a mixture kaolinite 11·10, montmorillonite 14·50, water 74·57 %. L. J. S.

[Goncharov (V. V.)] Гончаров (В. В.). К минералогии и генезису «сухаря Goncharov (V.). *On the mineralogy and genesis of "sukhar".* Труд Ломоносов. Инст. Акад. Наук СССР, Мин. Сер. (Trans. Lomonossov Ins Acad. Sci. USSR, Ser. Min.), 1937, no. 10, pp. 111–130, 4 figs. (Russian wit English summary.)

'Sukhar' (meaning 'rusk' in Russian) is a variety of flint-clay found among t

er Carboniferous coal-bearing strata near Borovichi, Novgorod district, S.R. It is a stone-like substance which does not soften on immersion in water. omposition it corresponds to a kaolinitic clay, as shown by the analysis: 44·72, TiO_2 1·98, Al_2O_3 38·87, Fe_2O_3 0·38, MgO 0·12, CaO 0·14, Na_2O 0·16, 0·26, SO_3 0·27, ign. loss 13·69, H_2O 1·56. 'Sukhar' is composed mainly of nite, but certain white patches in the rock contain free alumina, and the y analysis proved the presence of gibbsite. Plastic kaolinitic clays of the locality show the presence of abundant mica or mica-like mineral. It is osed that 'sukhar' is a product of a diagenetic alteration of kaolinitic clays cid hydrous solutions. S. I. T.

KSANDROV (V. P.), VOITZEKHOVSKY (A. E.), & LUCHITZKY (V. I.)] Александров (В. П.), Войцеховский (А. Е.) и Лучицкий (В. И.). Каолиновая промышленность СССР и стандартизация ее продукции. ALEXANDROV (V. P.), VOIZEKHOVSKY (A. E.), LUCHITZKY (V. I.). *The kaolin industry of USSR and standardization of its products.* Труды Всесоюзн. Научно-Иссл. Инст. Мин. Сырья (Trans. All-Union Sci. Research Inst. Econ. Min.), 1938, no. 126, 156 pp., 8 figs. (Russian with English summary, p. 142). Price 7 r.

ne kaolin occurrences and production of the U.S.S.R. are described, with h chemical data and with special reference to deposits in the Ukraine, Urals, Siberia. The kaolin of the chief Ukrainian deposits is said to equal the best gn grades. A very brief English summary occupies half a page. C. F. D.

SUPOVA (S. M.)] YUSSUPOVA (S. M.) Юсупова (С. М.). *Montmorillonite from west Sulyukta.* Compt. Rend. (Doklady) Acad. Sci. URSS, 1939, vol. 25, pp. 212–214, 1 fig.

grey, greasy clay alternating with seams of brown coal at Sulyukta, Uzbe- an, is used locally for making soap and for clarifying wine. Analysis gave $_2$ 57·3, TiO_2 0·21, Al_2O_3 23·60, Fe_2O_3 1·95, MgO 5·18, CaO 1·90, Na_2O 0·31,) 1·72, H_2O 6·5, ign. 6·32. Thermal curves (with breaks at 160°, 650°, 800°, 920°) and X-ray photographs indicate the presence of both montmorillonite kaolinite in the coarser fraction and of montmorillonite alone in the finer tion. L. J. S.

IYATCHENSKY (P. A.) Земятченский (П. А.). Спаллиты и аллиты в вопросах палеогеографии.—*Siallites and allites in the problems of paleogeography.* Изв. Акад. Наук СССР, Сер. Геол. (Bull. Acad. Sci. URSS, Sér. Géol.), 1940, no. 4, pp. 26–35 (Russ.), pp. 35–36 (English summary).

part from the heavy-mineral residues from sedimentary deposits, the finer rey materials will give some information as to former climates. From Russian rs and also deposits of salt and gypsum some indications are given of the nate of different geological periods. [Min. Mag. **21**–556.] L. J. S.

Zeolites.

IB (Arthur B.) & WOODHOUSE (John C.). *Adsorption by dehydrated chabasite as a function of the water content.* Journ. Amer. Chem. Soc., 1936, vol. 58, pp. 2637–2646, 11 figs.

The sorption of hydrogen, oxygen, and carbon dioxide by partially dehydrated

chabazite at temperatures between 0° and 100° C. has been examined. T sorption increases the more water has been removed until about 90 % of the wat has been removed, then decreases rapidly. At low degrees of dehydration, CO_2 far more strongly sorbed than oxygen, and oxygen more than hydrogen. T observations are interpreted on a basis of pores of various sizes, and latt collapse at high degrees of dehydration. M. H. H.

Meier (Adolph E.). *Association of harmotome and barium feldspar at Glen Ridd Pennsylvania.* Amer. Min., 1939, vol. 24, pp. 540–560, 5 figs.

A detailed petrographic study is given of a dike of anorthositic gabbro flank by serpentine. Harmotome as well-developed cruciform penetration twi 3–5 mm. long on a crust of gibbsite is found on the joint surfaces of the dike roc Optical and chemical data for the harmotome are: α 1·506, β 1·509, γ 1·51 $\beta : a = 23\frac{1}{2}°$, 2V 79°50′, sp. gr. 2·47; SiO_2 45·51, Al_2O_3 16·50, MgO 0·27, CaO 0·1 BaO 19·89, K_2O 1·77, Na_2O 1·18, H_2O (110° C.) 14·74, total 99·98. The increa of extinction-angle and decrease of 2V with loss of water was determined various temperatures up to a red heat. Two distinct types of hyalophane are al present as separate grains or as hyalophane-plagioclase antiperthites in the cru zones or solution cracks of the dike: $Or_{90}Cn_{10}$ from the central portion of t dike, sp. gr. 2·675, α 1·527, β 1·530, γ 1·532; and $Or_{85}Cn_{15}$ from the borders the dike, sp. gr. 2·697, α 1·532, β 1·535, γ 1·539. F. A. B.

Ross (Clarence S.). *Sedimentary analcite.* Amer. Min., 1941, vol. 26, pp. 627–62 3 figs.

A bed of dull grey-green material near Wikieup, Arizona [M.A. **4**–128], shows tuff structure and consists of grains (0·05 mm.) of analcime with films of nontroni clay. A nearly white porous tuff shows glass shards altered to analcime (grai 0·003–0·015 mm.) with some bentonitic clay. The alteration of glassy volcan ash to analcime, rather than to bentonite, was no doubt due to the presence sodium salts. L. J. S.

Shkabara (M. N.) Шкабара (М. Н.). *On the zeolites of the Crimea.* Compt. Ren (Doklady) Acad. Sci. URSS, 1940, vol. 26, pp. 659–661, 1 fig.

In the northern quarry at the village of Kurtzy near Simferopol fissures in a igneous rock are lined with zeolites, &c., of which the following generations a recognized. (1) Prehnite, quartz, heulandite (foliated masses), delessite, gmelini (homogeneous brick-red crystals with small basal planes), wellsite (small pi crystals), and analcime (cloudy crystals). (2) Prehnite, heulandite (small cle crystals), gmelinite (pink crystals with large basal plane and brick-red nucleus calcite, and quartz. (3) Wellsite (colourless crystals up to 1 cm.), phillipsit analcime (clear crystals), leonhardite, and calcite. (4) Delessite, iron hydroxide and calcium sulphates. Analyses I by E. A. Sturm of the brick-red nucle (α 1·480, γ 1·494) and II of the pink shell (α 1·482, γ 1·484) of gmelinite crystal which are optically uniaxial or biaxial and positive or negative. Thomsoni from Karadag gave anal. III; α 1·523, γ 1·535. Phacolite (sp. gr. 2·017, α 1·48

86) occurs only in the Magnitny range, associated with calcite, stilbite, ndite, and analcime.

SiO_2.	Al_2O_3.	Fe_2O_3.	MgO.	CaO.	Na_2O.	K_2O.	H_2O.	Total.	Sp. gr.
48·84	17·36		0·65	9·93	0·26	2·22	21·27	100·53	2·075
49·39	18·43		0·39	9·20	0·34	2·08	18·82	98·65	2·082
37·78	31·15	—	0·21	14·34	3·88	0·11	13·38	100·85	2·342

L. J. S.

ВАКА (M. N.) Шкабара (M. H.). *Zeolites of the Mama-Vitim mica-bearing egion.* Compt. Rend. (Doklady) Acad. Sci. URSS, 1941, vol. 32, pp. 420–423, fig.

pecimen of gneiss from Mt. Medvezhyi, Siberia, carried: chabazite, α 1·484, 88, sp. gr. 2·078, analysis (E. A. Sturm) gave SiO_2 50·38, Al_2O_3 18·41, trace, MgO trace, CaO 7·02, Na_2O 0·20, K_2O 3·12, H_2O 21·78, total 100·91; abazite is of two different habits, simple rhombohedra and penetration twins icolite type, *r e s o* [Dana's letters]; heulandite, α 1·499, γ 1·505, sp. gr. 2·242, ps *b c s t m* or *b e s t m u x* [Dana's letters]; epidesmine, α 1·492, γ 1·507, . 2·175. M. H. H.

ELLA (Vincent P.) & HEDQUIST (Wilbur). *Scolecite from Clark County, Nevada.* The Mineralogist, Portland, Oregon, 1942, vol. 10, pp. 107–108.

olecite has been discovered recently on the western shore of Dry Lake, iated with and sometimes replaced by chalcedony in detrital material from Black Mountains of the McCollough Range. An analysis gave SiO_2 46·40, 26·69, CaO 14·10, H_2O 13·53, total 100·72. J. M. S.

Miscellaneous.

MAN (Y. D.)] Готман (Я. Д.). К вопросу о свойствах касситерита в связи условиями его образования.—GOTMAN (J. D.). *On the properties of assiterite in connection with conditions of its formation.* Бюлл. Моск. Общ. Исп. Природы (Bull. Soc. Nat. Moscou), 1938, n. ser, vol. 46 (Sect. Géol., vol. 16), pp. 130–160, 18 figs. (Russian with English summary.)

ghteen samples of cassiterite from various U.S.S.R. localities were studied e author. Their chemical and spectrographic analyses, optical, and crystallo- ic data are given. The conclusions arrived at are much too detailed to be ded in the abstract, but the author made an attempt to correlate the ical, optical, and crystallographic characters of cassiterite crystals with genetic types. S. I. T.

ГОРОРОV (V. N.) Протопопов (В. Н.). Рентгено-спектроскопическое исследование итро-ортита, ортита, монацита и цирголитов северной Карелии. —*Roentgen and spectroscopic investigations of yttro-orthite, orthite, monazite, and zirtolites of the north Karelia.* Мат. центр. научно-иссл. геол.-разв. Инст., Геохимия, Сборн. 5 (Mat. Centr. Geol. Prosp. Inst., Geochemistry Magazine 5), 1940, pp. 30–54, 7 figs. (Russian with English summary.)

nalitative and quantitative estimations of the contents of rare-earths and ium by means of X-ray spectrographic methods were obtained for certain rals [cyrtolite, &c.] from north Karelia. S. I. T.

[Zhuravlev (V. F.) & Shamsonova (B. M.)] Журавлев (В. Ф.) и Шамсон (Б. М.). Некоторые результаты применения металлографических мето при определении твердости минералов и горных пород.—Jouravlev (V. & Shamsonova (B. M.). *Some results of applying metallographic method the determination of the hardness of* [*minerals and*] *rocks.* Мат. центр. науч иссл. геол.-разв. Инст., Геохимия, Сборн. 5 (Mat. Centr. Geol. Prosp. In Geochemistry Magazine 5), 1940, pp. 55–58, 1 fig.

After testing different methods for the determination of hardness of mine and rocks the authors have found that the method of Shore, based on ela rebound, provided the most accurate results. S. I. T.

Kravchenko (G. T.) Кравченко (Г. Т.). Турмалин 269 квартала Ниж Исетской дачи на Урале. [*Tourmaline of the 269th quadrangle of the Nizh Isetsky dacha in the Urals.*] Труды Инст. Геол. Наук, Вып. 9, Ми геохим. Сер. no. 1 (Trans. Inst. Geol. Sci., no. 9, Min.-Geochem. Ser. 1), 1940, 60 pp., 47 figs.

Tourmaline, together with chlorite and diaspore, is found in the central z of a desilicated pegmatite vein intrusive into serpentinite. Another part of central zone is occupied by corundum, and the whole is surrounded by zones chlorite and talc with an irregular mass of dolomite. The crystallographic stu of tourmaline shows the development of prisms and pyramid faces giv the crystals a hexagonal appearance. The optical study shows the presence differently tinted zones each characterized by different absorption and refracti The study of pyroelectric properties suggests that the morphologically hon geneous crystals are composed of differently orientated individuals intergro along the vertical axis. The chemical analyses of light and dark colou varieties show that the dark coloured variety is richer in Fe_2O_3, MgO, and The dark variety is also characterized by higher indices of refraction, bi fringence, pleochroism, and specific gravity. S. I. T.

[Vernadsky (V. I.), Vinogradov (A. P.), & Teis (R. V.)] Вернадский (В. И Виноградов (А. П.) и Тейс (Р. В.). Vernadsky (W. I.), Vinogradov (A. and Teis (R. V.). *Determination of the isotopic composition of waters metamorphic rocks and minerals.* Compt. Rend. (Doklady) Acad. Sci. URS 1941, vol. 31, pp. 573–576.

The elements of water entering into the composition of minerals from dee seated rocks might be expected to contain isotopes in different proportions fr those in water of the biosphere. The density (determined with a quartz float) water obtained by the ignition of several samples of chlorite- and chlorite-ta schists and pure talc is slightly higher than that of purified tap-water, rangi from $+8{\cdot}6$ to $14{\cdot}4 \times 10^{-6}$. In two specimens of talc-chlorite-schist this was fou to be due to the presence of the oxygen isotope O_{18}, the amount of deuteriu being less than in tap-water. L. J. S.

Berg (L. G.), Lepeshkov (I. N.), & Bodaleva (N. V.) Берг (Л. Г Лепешков (И. Н.) и Бодалева (Н. В.). *Quantitative analysis of natural salts the thermographic method.* Compt. Rend. (Doklady) Acad. Sci. URSS, 194 vol. 31, pp. 577–580, 3 figs.

The mineralogical composition of mixed salts, e.g. polyhalite, kieserite, glaub

rpsum, and anhydrite cannot be ascertained from a chemical analysis, but e deduced from the heating curves. L. J. S.

ANOV (G. P.) Барсанов (Г. П.). *On the finding of tin in lievrite.* Compt. Rend. (Doklady) Acad. Sci. URSS, 1941, vol. 31, pp. 594–597.

phide skarns in limestone near a granite contact at Maly Mukulan in the rdin Balkar republic, Caucasus, contain ilvaite with chlorite, actinolite, gsite, pyrrhotine, magnetite, blende, and small amounts of stannite and erite. The ilvaite is transparent only in thin sections with strong pleo- m, α reddish-brown, γ opaque black, *n* about 1·9, sp. gr. 3·844. Analysis SiO_2 29·30, TiO_2 0·10, Al_2O_3 2·21, Fe_2O_3 17·23, FeO 31·08, MnO 1·98, MgO aO 12·72, Na_2O 0·23, K_2O 0·25, SnO_2 0·75, S 0·63, Cl trace, H_2O (ign.) 2·44, 0·40, total '100·34', agreeing with $1{\cdot}4CaO.3(Fe'',Mg,Mn).(Fe''',Al)_2O_3.$ H_2O. Spectroscopic analysis shows the presence of tin in ilvaite from some localities. The conditions for the deposition of tin in silicates are discussed. L. J. S.

(N. G.) Сумин (Н. Г.). *Rosasite from the Kyzyl-Espe deposit.* Compt. Rend. (Doklady) Acad. Sci. URSS, 1941, vol. 31, pp. 779–781.

ydrous copper-zinc carbonate from the Kyzyl-Espe lead-zinc ores in NE. stan, as minute crystals on cerussite, is identified on optical grounds action straight, elongation negative, α 1·683, γ 1·84, 2V very small, hardness o cleavage, sp. gr. 4·09) as the rare mineral rosasite. M. H. H.

NTIEV (B. N.), Semenov (P. K.), & Chirvinsky (P. N.) Мелентьев (Б. Н.), Семенов (П. К.) и Чирвинский (П. Н.). *Calcite in the decomposed tectonic ones of the Chibiny tundras.* Compt. Rend. (Doklady) Acad. Sci. URSS, 941, vol. 31, pp. 782–783.

own ferruginous calcite (analysed) from the Kola peninsula forms hexagonal s with obtuse rhombohedron, zonally coloured by limonite and sometimes w, and is associated with chabazite (optically negative, zoned) and pseudo- hs of limonite after chalybite. M. H. H.

OPENKO (N. M.) Прокопенко (Н. М.). *Principal stages in the history of ndium in the earth's crust.* Compt. Rend. (Doklady) Acad. Sci. URSS, 1941, ol. 31, pp. 903–906.

istribution of indium in Transbaikal. Ibid., pp. 907–908.

dium is concentrated mainly in sulphides associated with granites, grano- es, and monzonites. It is rare in association with basic or alkalic rocks, or gmatites. It is found mainly in blende, cassiterite, wolframite, and stannite. occurrence of indium in these minerals in Transbaikal is described. [M.A. 2; **7**–107, 310; **8**–142, 178.] M. H. H.

RIK (I. E.), Samartzeva (A. G.), & Yashchenko (M. L.)] Старик (И. Е.), Самарцева (А. Г.) и Ященко (М. Л.) Starik (I. E.), Samartzeva (A. G.) and Jastchenko (M. L.). *Solubility of secondary uranium minerals.* Compt. Rend. (Doklady) Acad. Sci. URSS, 1941, vol. 31, pp. 909–910.

tunite and zeunerite are only very slightly soluble (less than baryte) in

water. Experiments gave varying results: 0·03–0·80 mg. U per litre in distil water at 25° C., and 0·75–2·3 in tap-water. L. J. S

[Belyankin (D. S.) & Petrov (V. P.)] Белянкин (Д. С.) и Петров (В. Beliankin (D. S.) and Petrov (V. P.). *Hibschite and plazolite.* Com Rend. (Doklady) Acad. Sci. URSS, 1941, vol. 32, pp. 66–68, 2 figs.

Hibschite (n 1·686) occurs replacing garnet (n 1·822), with wollaston xonotlite, gehlenite, and thaumasite (ϵ 1·469, ω 1·508). In paragenesis, as composition, it is very close to plazolite. Hibschite is probably much m common than has been thought. [M.A. **7**–462; **8**–101, 145.] M. H. H

Starik (I. E.), Kravchenko (L. L.), & Melikova (O. S.) Старик (И. І Кравченко (Л. Л.) и Меликова (О. С.). *A finding of ferrithorite in nc Kirghizia.* Compt. Rend. (Doklady) Acad. Sci. URSS, 1941, vol. 32, 254–255.

Ferriferous thorite (SiO_2 10·22, TiO_2 0·13, Fe_2O_3 12·02, FeO 3·55, Al_2O_3 4· ThO_2 51·47, rare-earths 5·59, MnO 1·93, U_3O_8 0·41, CaO 1·62, MgO 0·12, Na_2O K_2O 0·26, P_2O_5 0·88, V_2O_5 nil, As_2O_5 0·51, CuO 0·23, SnO nil, Cl 0·2, H_2O 5· Pb, Ge traces, Sb, Bi nil, total '98·98', sp. gr. 4·96) occurs at Kuperlisai, no Kirghizia, massive with quartz, mica, fluorite, pyrite, zircon, cassiterite, xe time, and beryl (?); it is metamict; hardness $4\frac{1}{2}$. The associated fetid fluorit dark violet (Ca(+Sr) 50·94, F 46·89, Fe_2O_3 0·10, ThO_2+rare-earths 0·05, M 0·22, Al_2O_3 0·43, SiO_2 0·73, total '99·86'). [*Cf.* ferrothorite, Min. Mag. **21**–564 M. H. H

Vakar (V.) Вакар (В.). *A "farinaceous" scheelite from the sub-polar Ura* Compt. Rend. (Doklady) Acad. Sci. URSS, 1941, vol. 32, pp. 265–266.

Veins in metamorphosed felsites on the upper course of the Torgovaya ri carry quartz, chlorite, pyrite, chalcopyrite, scheelite, basobismutite, a bismuthinite; also sporadically carbonates, ilmenite, cassiterite, molybdeni &c. The scheelite is a fine powder, mostly less than 0·02 mm., and is believed have been disintegrated by frost action; it is chemically unaltered.

M. H. H.

Logvinenko (N. V.) Логвиненко (Н. В.). *Goyazite in the Carboniferous Lin stones of the Donetz basin.* Compt. Rend. (Doklady) Acad. Sci. URSS, 194 vol. 32, pp. 267–268.

In cavities in the limestones of the Belaya Kalitva region goyazite (uniaxi ϵ 1·638, ω 1·632) was found, with baryte and quartz. Its paragenesis is discusse M. H. H.

Godlevsky (M. N.) & Ivanov (A. A.) Годлевский (М. Н.) и Иванов (А. А *Lueneburgite from the Stebnik potassium salt deposit.* Compt. Rend. (Doklad Acad. Sci. URSS, 1941, vol. 32, pp. 351–353, 1 fig.

A white boron mineral occurring as small nodules in grey silty rock-salt in t potash deposits of Stebnik in Poland proved to be lüneburgite (analy by E. N. Egorova, SiO_2 0·10, $(Al,Fe)_2O_3$ 0·20, CaO trace, MgO 23·53, K_2O 0· Na_2O 0·33, B_2O_3 13·08, P_2O_5 25·64, SO_3 0·57, Cl 2·36, H_2O+ 27·21, H_2O- 7·

00·83); it consists of minute laths and optical data obtained are in close ent with Larsen's results. M. H. H.

LUN (T. N.) & NESTEROVA (Y. S.)] Шадлун (Т. Н.) и Нестерова (Ю. С.) ADLUN (T. N.) and NESTEROVA (J. S.). *Some new sulphates from the yava sulphate deposits (south Urals)*. Compt. Rend. (Doklady) Acad. Sci. RSS, 1941, vol. 32, pp. 354–357.

molnskite' [i.e. szomolnokite] (sp. gr. 3·03–3·07, α 1·591, γ 1·665; two s), römerite (dark brown, sp. gr. 2·122, α 1·528, γ 1·584; two analyses), and -alum (white, sp. gr. 1·760, isotropic, n 1·458; one analysis) occur in the a sulphate deposits with gypsum, melanterite, chalcanthite, halotrichite, te, and fibroferrite. M. H. H.

ISHVILI (E. K.)] Везиришвили (Е. К.) VESIRISHVILI (E. K.). *Types of nabar crystals from High Ratcha and Abkhasia (Great Caucasus)*. Compt. nd. (Doklady) Acad. Sci. URSS, 1941, vol. 32, pp. 416–419, 2 figs.

abar crystals from Akhei, Abkhasia, and from Talakhiani and Boko, High , are described and figured. M. H. H.

VSKAYA (N. V.) Петровская (Н. В.). *Sulvanite from the Lebedinoye gold-ore posit (Aldan)*. Compt. Rend. (Doklady) Acad. Sci. URSS, 1941, vol. 32, p. 424–426.

anite occurs with bornite in the Lebedinoye ore in Siberia; analysis of al containing about 5% quartz gave V 3·60, As 7·16, Cu 49·40, S 31·66; examination by N. V. Belov showed it to be cubic with a 5·37 Å. M. H. H.

LOVICH (A. I.) Фасталович (А. И.). *On the dendritic structure of crystallites native gold*. Compt. Rend. (Doklady) Acad. Sci. URSS, 1941, vol. 32, pp. 30–431.

careful electrolytic etching of a polished surface in 20% KCN, many gold ts showed a dendritic structure. M. H. H.

SIMOVSKY (V. I.) Герасимовский (В. И.). *On villiaumite from the Lovozero ndras*. Compt. Rend. (Doklady) Acad. Sci. URSS, 1941, vol. 32, pp. 92–495.

iaumite occurs as carmine-red grains filling interstices in sodalite-syenite ujavrite. It is very weakly birefringent, distinctly pleochroic (light yellow ink), refractive index 1·3253 for λ 6200 Å., 1·3272 for 5200 Å.; analysis (K. a) gave Na 53·83, K 0·32, F 45·28, insol. 0·84, total '100·12'. Villiaumite bably fairly widespread in the Lovozero and Khibina rocks, but is likely to ssed since it is readily leached out. The cavities in some of these rocks, called ites and supposed to be after calcite [M.A. **2**–381], are probably after imite. M. H. H.

ATSCHKI (F.). *Zur Frage der Stellung des Erikits im Mineralsystem*. Zentral-latt Min., Abt. A, 1942, pp. 1–3.

kite [M.A. **8**–222] from Julianehaab, Greenland, shows imperfect crystals

consisting of a confused aggregate of minute individuals, and it is not suita for X-ray examination. Although described as orthorhombic, the interfa angles are close to those of apatite, and it is suggested that this silico-phosph of rare-earths belongs to the apatite group, containing less silica than abu malite and britholite [M.A. **7**–395]. L. J. S

Ramdohr (Paul). *Gratonit aus den oberschlesischen Bleizinkerzgruben.* Zent blatt Min., Abt. A, 1942, pp. 17–32, 9 figs.

Gratonite, $Pb_9As_4S_{15}$ [M.A. **7**–512], is identified from several of the Pb mines in Upper Silesia, where it had previously been described as one type jordanite [M.A. **4**–409]. It forms prismatic crystals, up to 8 cm. long and 2 thick, of trigonal habit like tourmaline. Fresh crystals embedded in sh blende ('Schalenblende') are difficult to isolate. These are sometimes pseu morphosed to jordanite or to a mixture of galena and meneghinite (?). Isola pseudomorphs of cerussite and anglesite after gratonite occur in the Ursula m near Beuthen. Approximate goniometric and X-ray measurements (*a* 17·7 *c* 7·815 Å.) agree with those for the original gratonite from Peru. No chemi analysis is given. Some crystals show different rhombohedra at the two en and it is suggested that they are trigonal pyramidal (C_3, not C_{3v} as tourmalin this would be the first mineral example of this class of symmetry. The charact of the mineral as seen on polished sections are described in detail, and the comp tion of the lead sulpharsenites is discussed. L. J. S

Meixner (Heinz). *Das angeblich „Fournetit"-artige Fahlerz aus der Magne lagerstätte Veitsch (Steiermark).* Zentralblatt Min., Abt. A, 1942, pp. 4–1

The analysis of 'lead-fahlerz' ('fournetite') given by Hueber and Freh [M **5**–136] from Veitsch, Styria, showed Pb 14·29, Zn 7·94, Sb only 2·42% &c. material contains no lead and very little Zn, but much Sb. Microscopic exami tion of polished specimens showed normal fahlerz without any admixed gale Hueber and Freh's explanation of the formation of pitchy-copper-ore is a criticized. L. J. S

Barić (Ljudevit). *Disthen vom Greiner in Tirol und vom Monte Campi (Schweiz). Ein Beitrag zur Kenntnis der kristallographischen Eigenschaf des Disthens.* Neues Jahrb. Min., Abt. A, 1940, vol. 76, pp. 36–70, 4 pls. text-figs.

Detailed goniometric measurements on a number of crystals of kyanite fr these localities gave the following mean values for the axial ratios, $a:b:c$ 0·9066 : 1 : 0·7102, α 89° 58½′, β 101° 8⅓′, γ 105° 57′. Of the 58 crystal-forms no 20 are in the zone [001] and the following 26 are new: $(4\bar{3}0)$, $(3\bar{4}0)$, $(2\bar{5}0)$, $(0\bar{1}$ $(0\bar{4}1)$, $(10\bar{1})$, $(\bar{2}01)$, $(\bar{3}01)$, $(\bar{4}11)$, (321), $(\bar{3}21)$, $(\bar{3}\bar{2}1)$, $(2\bar{2}1)$, $(2\bar{4}1)$, $(2\bar{3}1)$, $(\bar{5}44)$, $(11$ $(\bar{2}\bar{1}2)$, $(\bar{3}\bar{1}4)$, $(\bar{2}13)$, $(\bar{2}\bar{1}3)$, $(14\bar{2})$, $(12\bar{2})$, $(1\bar{3}3)$, $(11\bar{4})$, $(\bar{1}\bar{5}4)$. Tables of angles given, and corrections to previous papers on the crystallography of kyanite. L. J. S

Hödl (Alfred). *Über Chlorite der Ostalpen. Ein Beitrag zur Systematik Chlorite.* Neues Jahrb. Min., Abt. A, 1941, vol. 77, pp. 1–77, 3 pls.

Optical data are given for 30 specimens of chlorites (11 analysed) from vario

es in Styria and Carinthia. Optical data are collected from the literature emical formulae are calculated for each of 130 published analyses. Iron-free es include: antigorite, pennine, leuchtenbergite, sheridanite, and amesite; containing iron are: Fe-antigorite, pennine, clinochlore, grochauite, Mg-orite, prochlorite, Fe-prochlorite, thuringite, corundophyllite, and daph-Chemical formulae are given for each of these. They can be distinguished lly by their anomalous interference-colours and the refractive indices. ences in the eastern Alps are in mineral crevices of the Alpine type, in tine rocks, with iron ores, and in metasomatic talc-magnesite deposits.

L. J. S.

CK (Friedrich). *Mineralogische Mitteilungen. 1. Variscit von »Friedrich ugust Stolln« bei Sosa (Eibenstock). 2. Weisbachit, ein Bleibaryumsulfat.* in. Petr. Mitt. (Tschermak), 1941, vol. 52, pp. 363–364.

l-developed ($\frac{1}{2}$ mm.) crystals of variscite projecting from small white s on pyrolusite and haematite from this locality in Saxony are ortho-ic with $a:b:c = 0{\cdot}8695:1:0{\cdot}9710$ with the forms $c(001)$ and $p(111)$, and morphous with scorodite and strengite. Analysis, P_2O_5 44·87, Al_2O_3 32·38, 2·83 = 100·08, agrees with $AlPO_4.2H_2O$. Weisbachite [Min. Mag. **21**–580] at Sierra Gorda, Chile, as small, yellow, short-prismatic crystals (c m) rism angle 76° 20′ and sp. gr. 5·9. Analysis by T. Döring, SO_3 28·30, PbO BaO 8·45, Fe_2O_3 0·56, CaO 0·33, MgO 0·23 = 100·23, agrees with $5PbSO_4$. . It is feebly radioactive.

L. J. S.

ER (Robert L.). *Systematische Übersicht mineraldiagnostisch wichtiger Mikro-eaktionen.* Schweiz. Min. Petr. Mitt., 1941, vol. 21, pp. 139–160, 24 figs. on plates.

election of methods for the qualitative analysis of minerals on the micro-nearly all the reactions selected are crystallization reactions.

M. H. H.

EY (C. O.). *Simple method for determination of water in silicates.* Bull. eol. Surv. Great Britain, 1939, no. 1, pp. 8–12, 1 fig.

e method involves a minimum of special apparatus, and ranks with the ld method in simplicity and speed, but with the silica combustion-tube od in accuracy.

M. H. H.

AY (J. D. H.). *Morphologie cristalline de la microlite.* Trans. Roy. Soc. anada, 1941, ser. 3, vol. 35, sect. 4, pp. 51–56.

out 50 crystals of microlite from Morefield mine, Amelia, Virginia, together published descriptions, give the following forms in order of decreasing rtance: (111), (011), (113), (001), and uncertain (122), (112). This suffices to e 'morphological aspect' [M.A. **8**–4] *Fd*** (and the holohedral space-group *Fd3m*) in which the theoretical order is (111), (011), (113), (001), (133), (115), (135) . . . The minimum cell content compatible with the possible ic positions correctly gives the cube-edge 10·3 Å.

M. A. P.

Donnay (J. D. H.). *Analyse morphologique de la danburite.* Trans. Roy. S
Canada, 1940, ser. 3, vol. 34, sect. 3, pp. 33–43, 1 fig.

The space-group (D_{2h}^{16} = *Pnam*) and absolute cell dimensions (*a* 8·03, *b* 8·
c 7·71 Å.) of danburite are correctly inferred, without X-ray measurements, fr
the morphology, composition, and density. The determination of the spa
group rests on the approximate proportionality between the importance o
form and the spacing of the corresponding structural planes in space-grc
notation [Donnay's law, Min. Mag. **26**–107]. The cell dimensions are predic
on the assumption that the cell content is the smallest that suits the equival
positions in the space-group. M. A. P.

Donnay (J. D. H.) & Faessler (Carl). *Trisoctahedral garnet from the Black L
region, Quebec.* Univ. Toronto Studies, Geol. Ser., 1941, no. 46, pp. 19–2

Pale green crystals of garnet (essentially andradite) with sp. gr. 3·69, show t
unusual combination (122) with smaller (011) and (112). The average order
importance of the forms of garnet, given by 65 published figures, is (011), (11
(123), (001), (012); (223), (134) . . . in good agreement with the theoretical or
in the space-group O_h^{10} = *Ia3d*, (112), (022), (123), (004), (024), (233), (134) .
Conversely, the space-group can be predicted from the average habit and t
cube-edge can be calculated (*a* 11·83 Å.) from the smallest cell content compati
with the space-group. M. A. P.

Strock (Lester W.). *A new helvite locality—a possible beryllium deposit.* (P
liminary report.) Econ. Geol., 1941, vol. 36, pp. 748–751.

Brown-red helvine, occasionally as crystals (8 mm.), also lemon-yellow a
colourless varieties, occur with garnet carrying Sn 0·3%, magnetite, &c.,
metamorphic limestone 10 miles N. of Chloride, New Mexico. One ore-body
this promising deposit gives BeO 3%. M. A. P.

Murdoch (Joseph) & Gardner (Dion L.). *Löllingite from the Philippine Islan*
Econ. Geol., 1942, vol. 37, pp. 69–75, 3 figs.

This rare mineral occurs abundantly as flake-like crystals, crystal grains
mm.), and granular aggregates in the gold ore of the San Mauricio mine, Paraca
district. The crystals (sp. gr. 6·9) show *m*(110), *l*(011), *e*(101), and give goni
metric and single-crystal X-ray measurements agreeing with those obtained
löllingite from Franklin Furnace, N.J. [M.A. **3**–453; **5**–175]. Homogeneous
polished section, with strong anisotropism and distinctive reactions to HN
and aqua regia. Analysis by F. A. Gonyer, calculated to 100 after withdrawi
quartz: As 67·64, Sb 0·11, S 1·08, Fe 29·31, Cu 0·86; spectrographic traces
Co, Pb, Mn. M. A. P.

Gabriel (Alton), Slavin (Morris), & Carl (H. F.). *Minor constituents in spod
mene.* Econ. Geol., 1942, vol. 37, pp. 116–125.

Pure spodumene from eight localities in the U.S. shows no variation of optic
properties (α 1·660, γ 1·675; max. $\gamma : c$ +25°) or of X-ray powder pattern (inte
sities and spacings given). Quantitative spectrographic analyses on eleve
samples show Fe, Mn, Ti, Ga, Na, K, in each sample, Sn in nine samples, Rb
one. M. A. P.

ON (Samuel G.). *The crystallography of fibroferrite.* Notulae Naturae, Acad. Nat. Sci. Philadelphia, 1942, no. 102, 2 pp., 1 fig.

nute acicular crystals ($\frac{1}{4}$ mm. long) of fibroferrite from the sulphate vein in anta Elena mine, La Alcaparrosa, prov. San Juan, Argentina [M.A. **7**–107; , 188], are orthorhombic with $a:b:c = 0{\cdot}5604:1:0{\cdot}2162$, forms b(010),), m(110), d(101), g(401), t(131), ϵ(161), u(532), and perfect (001) cleavage. are twinned on (110) forming pseudo-trigonal triplets. L. J. S.

ON (Samuel G.). *Results of the Chilean mineralogical expedition of 1938. Part VIII.—The crystallography of ferrinatrite.* Notulae Naturae, Acad. Nat. Sci. Philadelphia, 1942, no. 103, 4 pp., 3 figs. [M.A. **8**–278.]

rrinatrite (= ferronatrite) occurs in the sulphate deposits of La Compania near Sierra Gorda, Alcaparossa near Cerritos Bayos, and Salvadora mine Quetena, also at Chuquicamata [M.A. **7**–223], and, if leucoglaucite [M.A. , **6**–149] is identical, at Tierra Amarilla near Copiapó, all in the Atacama t. The prismatic crystals are hexagonal-scalenohedral with $a:c = 1:0{\cdot}6425$, crystal-forms $u(11\bar{2}1)$ and $v(21\bar{3}1)$, and perfect $a(11\bar{2}0)$ cleavage; sp. gr. , ω 1·557, ϵ 1·611. Analysis by W. Pitman, SO_3 51·00, Fe_2O_3 17·47, Na_2O , K_2O 0·39, H_2O 11·62 = 100·51, agrees with $3Na_2O.Fe_2O_3.6SO_3.6H_2O$.

L. J. S.

ARDS (A. B.). *A note on some tantalum-niobium minerals from Western Australia.* Proc. Australasian Inst. Mining & Metall., 1940, no. 120, pp. 731–744, 4 pls.

rious minerals analysed by E. S. Simpson [Min. Mag. **18**–107; M.A. **4**–9, 315, &c.] were examined in reflected light on polished surfaces and the results ching tests are noted. A tetragonal crystal from Globe Hill (anal. I by . A. Grace) shows the characters of rutile, and is named tantalo-rutile (to ce the name ilmenorutile). Similar material from Melville (anal. II) shows a ar intergrowth of ilmenite in tantalo-rutile, suggesting the unmixing of a solution.

TiO_2.	Ta_2O_5.	Nb_2O_5.	FeO.	MnO.	SnO_2.	SiO_2.	H_2O.	Total.	Sp. gr.
66·28	15·44	8·64	8·00	trace	1·24	0·32	0·18	100·10	4·83
43·20	7·61	33·31	10·81	3·61	0·39	0·60	0·16	99·69	4·90

rrotantalite from Greenbushes containing SnO_2 1·51% shows no trace of terite; while manganomossite containing SnO_2 4·5% shows grains of cas- te. Cassiterite from Greenbushes containing $(Ta,Nb)_2O_5$ 3·86% and ite from Ubini containing $(Ta,Nb)_2O_5$ 17·5% both show inclusions of lite. Stibiotantalite from Greenbushes shows inclusions of ferrotantalite.

L. J. S.

LWELL (F. L.) & EDWARDS (A. B.). *Coated gold from Cobar, New South Wales.* Proc. Australasian Inst. Mining & Metall., 1941, no. 121, pp. 1–10, 4 pls.

black table-concentrate containing Au 129 oz. and Ag 52 oz. per ton, but ing no visible gold, consists mainly of pyrite and mispickel together with chalcopyrite, pyrrhotine, native bismuth, and blende. Grains of gold are

completely or partly coated by these minerals and also by maldonite (Au_2Bi galenobismutite, and AgCl. L. J. S.

Hutton (C. O.). *The chemical composition and optical properties of the mine substance composing an enterolith.* New Zealand Journ. Sci. Techn., Sect. 1941, vol. 23, pp. 9B–12B, 1 fig.

Analysis by F. T. Seelye of an intestinal concretion found on a raised beach prov. Marlborough, New Zealand, gave P_2O_5 31·45, Fe_2O_3 0·20, FeO 15·10, M 2·95, MgO 16·40, Na_2O 0·04, CO_2 trace, H_2O+ 28·30, H_2O- 2·45, insol. 0· organic matter 2·81 = 100·00, agreeing with $(Mg,Fe,Mn)_3(PO_4)_2.8H_2O$. T sp. gr. 2·35 and optical data, α 1·5468, β 1·5533, γ 1·5820, 2V 55–60°, positi $\gamma : c = 28$–30°, are between those of bobierrite and vivianite [M.A. **7**–259], a the material is a rare intermediate member of this series—an iron-rich bobierri L. J. S.

Zechmeister (L.) & Frehden (O.). *A chromatographic study of lignite.* Natu London, 1939, vol. 144, p. 331.

Zechmeister (L.) & Stewart (W. T.). *The isolation of some compounds fr North Dakota lignite.* Journ. Amer. Chem. Soc., 1941, vol. 63, pp. 285 2852.

The isolation of well-characterized crystalline organic compounds from t lignites is described. M. H. H.

Sen Gupta (K. K.). *Note on an occurrence of scheelite near Agargaon, Nag district.* Quart. Journ. Geol. Mining Metall. Soc. India, 1941, vol. 13, 179–182.

Scheelite is found with wolframite, apatite, chalcopyrite, pyrite, covelli molybdenite, and chlorite, in crushed quartz veins penetrating mica- and to maline-schists. It is massive and resembles quartz in appearance. No ot occurrence of scheelite appears to have been recorded from India. C. F. D.

Das-Gupta (Jyotirmoy). *Microchemical investigations on spotted muscovite mi* Journ. Indian Chem. Soc., 1941, vol. 18, pp. 381–382, 1 fig.

The black specks and dendritic markings in muscovite from Nellore are sho to be magnetite. L. J. S.

Chatterjee (N. N.). *Free sulphur in some weathered Tertiary coal specimens India.* Quart. Journ. Geol. Mining Metall. Soc. India, 1942, vol. 14, pp. 1

Specimens of coal exposed to the moist air in a Calcutta museum when c taining pyrite became coated with a white fibrous efflorescence of iron sulpha sometimes with granules of sulphur, and the coal fell to powder. The sulphu more often seen on the under side of the specimens where moist air had less f access. The reaction suggested is: FeS_2 (or coal)$+Fe_2(SO_4)_3 = 3FeSO_4+2$ In the presence of water this would again disappear: $2S+6Fe_2(SO_4)_3+8H$ $= 12FeSO_4+8H_2SO_4$. L. J. S.